Vol. 890 Number 1

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UNITED STATES PATENT OFFICE

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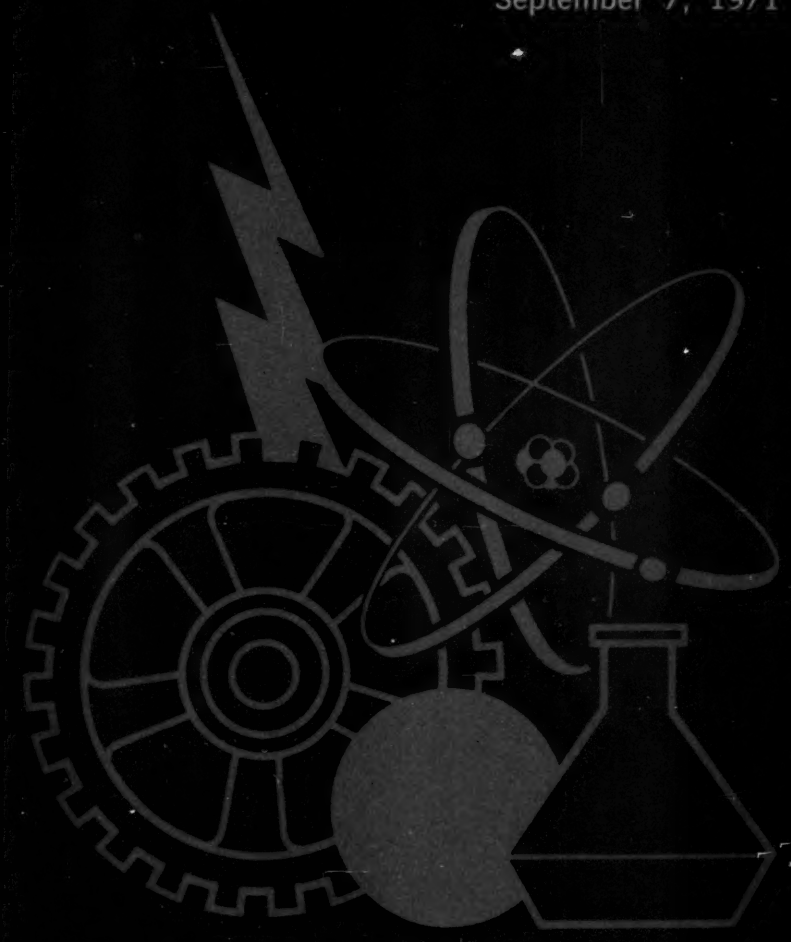
PATENTS

September 7, 1971



U. S. DEPARTMENT OF COMMERCE

Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

September 7, 1971 Volume 890 Number 1

CONTENTS

	Page
Issue of September 7, 1971	1
Patents and Trademark Notices	
Printing of Chemical Patents	2
Establishment of Manual of Trademark Examining Procedure	2
Registration to Practice	2
Recognition of Attorneys and Agents	2
Relief in Cases Affected by the Postal Emergency of March 1970	2
Licensing Department Inventions—Department of Agriculture	3
Patent Suits	3
Patent Notices	
Certificates of Correction for the Week of September 7, 1971	5
Disclaimers	5
Condition of Patent Applications	6
Patents Granted	
General and Mechanical	7
Electrical	201
Design Patents Granted	278
Index of Patentees	PI 1
Indices of Designs	PI 29
Classification of	
Patents	PI 33
Designs	PI 35
Geographical Index of Residence of Inventors	
Patents	PI 36
Designs	PI 38

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Printing of Chemical Patents

In view of financial and scheduling considerations associated with the closing of Fiscal Year 1971, no chemical patents will appear in the patent issues of August 24 and 31, and September 7 and 14, 1971. Chemical patents will again be issued on September 21, 1971.

RICHARD A. WAHL,
July 6, 1971. *Acting Commissioner of Patents.*

Establishment of Manual of Trademark Examining Procedure

Preliminary work has begun on the preparation of a Manual of Trademark Examining Procedure.

Directives on trademark examining procedure will be issued by the Patent Office from time to time and, when appropriate, will be included in the Manual at a later date. The directives will be numbered sequentially and those issued prior to publication of the Manual will be designated as Series 1. These directives will constitute the guidelines for the examination of trademark applications.

Trademark Examining Directives are available through the Superintendent of Documents, Washington, D.C., 20013 at an annual subscription of $1.50 plus 50¢ for foreign mailing.

ROBERT GOTTSCHALK,
July 27, 1971. *Acting Commissioner of Patents.*

Registration to Practice

The following list contains the names of former examiners who are applying for registration to practice before the Patent Office on the basis of 4 years or more service in the Examining Corps.

Information tending to affect the eligibility of said applicants on moral or ethical grounds should be furnished the Commissioner of Patents on or before September 27, 1971.

Burke, Sam D.,III, 44 Jackes Ave., #1604, Toronto 7, Ontario, Canada

Cabic, Edward Joseph, 2111 Jefferson Davis Hwy., #613N, Arlington, Va., 22202.

Carvis, Thaddius J., 1260 Hope St., Apt. D, Stamford, Conn., 06907

ROBERT GOTTSCHALK,
Aug. 9, 1971. *Chairman, Committee on Enrollment.*

Recognition of Attorneys and Agents

In connection with the revised rules concerning recognition of attorneys and agents, published in the Federal Register July 2, 1971 (36 F.R. 12616), the Patent Office will operate under the following procedures.

The Patent Office will continue to give effect to powers of attorney and authorizations of agent naming firms filed, with respect to patent applications, before the effective date of the rules, July 2, 1971.

As stated in the revised rules, powers of attorney or authorizations of agent naming firms of attorneys or agents filed in patent applications after July 2, 1971 will not be recognized. However, the Patent Office will construe any such powers or authorizations filed prior to October 1, 1971, as a direction to consider the address of the firm as the correspondence address for the application.

The privilege afforded by revised Rule 34(a) of the Rules of Practice in Patent Cases as to recognition of registered attorneys and agents not of record will apply to all applications whether filed before or after the effective date. Attention is called to the requirement of Rule 34(a) that a paper filed by a registered patent attorney or agent in an application in which he is not of record should include both his signature and registration number.

Powers of attorney and authorizations of agent under Rule 34(b) naming one or more registered individuals may continue to be made.

As prior to the effective date of the revised rules, where a paper is hand delivered to the Office and that paper has been properly signed by a registered attorney or agent whether or not of record in the particular case involved, a duplicate copy may be appropriately marked by the Patent Office employee receiving the original and returned to the person delivering the paper. As an example, a duplicate copy of a request for an extension of time to make a response may be marked approved, initialed or signed, and returned to the delivering person.

WILLIAM E. SCHUYLER, JR.,
Aug. 5, 1971. *Commissioner of Patents.*

PATENTS AND TRADEMARKS

Relief in Cases Affected by the Postal Emergency of March 1970

On June 30, 1971, President Nixon signed into law Public Law 92-34.

Public Law 92-34 requires claims for the benefit of an earlier filing date (Section 1.) and requests for such other relief as may be appropriate (Sec. 2.) to be filed in the Patent Office within 6 months after enactment, that is by December 30, 1971. Failure to file a statement within the noted period will result in loss of right to take advantage of the benefits of the law. Further explanation or evidence may be required at a subsequent time. Public Law 92-34 provides relief only for situations caused by the postal emergency which began on March 18, 1970, and ended on or about March 30, 1970, and for which there is no remedy under existing law.

The following explanation is designed to serve as a guide for persons desiring relief under the law.

The verified statement required to be filed under sections 1 and 2 of the law may be by any of the following:

(a) Applicant(s) for patent or trademark registration;
(b) Patentee(s) or trademark registrant;
(c) Owner(s) of record.

In cases involving plural inventors, statements made under (a) or (b) must be signed by all inventors.

The verified statement must specify the particular earlier date of receipt in the Patent Office to which the applicant, patentee or trademark registrant, or owner of record believes his application, fee or other paper would be entitled except for the delay caused by the postal emergency of March, 1970. The statement must be verified, that is, in the form of an oath or declaration. (37 CFR 1.68 (Patent Rule 68) and 2.20 (Trademark Rule 2.20).)

Evidence will not normally be required or considered by the Patent Office regarding a claimed filing date of March 18, 1970, or later, in applications actually filed before June 1, 1970. Claims for earlier filing dates in cases actually filed after June 1, 1970, or claiming a date prior to March 18, 1970, will be considered prima facie unreasonable unless an acceptable explanation of the basis for the claim is filed in the Patent Office with the claim or within 1 month or such longer time as may be prescribed by the Commissioner. Any claim not accepted by the Patent Office because it is obviously defective on its face or unreasonable may be subjected to further review by petition to the Commissioner.

The statement should adequately identify the involved application, patent, or trademark registration by including the name of the applicant, patentee or registrant, title of the invention or an identification of the mark, serial number, filing date, group art unit number and any other identifying data such as status of the case (e.g., awaiting first action, amendment, brief, etc.). Acceptable statements will be acknowledged, made of record and retained in the Patent Office files.

When practical, earlier filing dates accorded under this law, as well as the originally granted filing dates, will be identified on ensuing patents and trademark registrations. These dates will also be included in the OFFICIAL GAZETTE in connection

with patents, trademark registrations and trademarks published for opposition. In other cases, such as applications in issue prior to filing of a claim, the patent or trademark registration number and claimed filing dates will be published in the OFFICIAL GAZETTE after December 30, 1971.

Patents issued with earlier filing dates afforded by this law will not be effective as prior art as of such earlier filing dates under subsection 102(e) of title 35 of the United States Code.

In a pending patent application in which a claim for an earlier filing date has been acknowledged under this law, applicants need not file a Rule 131 affidavit to overcome a reference having an effective filing date between the "earlier" and the actual filing date of the application. Intervening references of this type will be cited but not applied by the examiner. Although a statement claiming an earlier date is accepted by the Patent Office, the claimed earlier date may be called into question in subsequent inter partes proceeding in the Patent Office or in the courts. In these proceedings, the applicant or owner may be required to present further evidence establishing the filing date to which the application is entitled. In such cases a definite determination shall be made as to whether the applicant is entitled to the earlier date under the law.

In cases where a patent application or an application for registration or late renewal of a trademark is determined to have become abandoned for failure to meet a statutory time limit because of the postal emergency, the application will automatically be restored to pending status by the acceptance of the request, and prosecution or other processing of the application will be resumed. Similarly, if a trademark registration is determined to have been cancelled for failure to meet the statuory time limit within which to file the affidavit required under section 8 of the Trademark Act (15 U.S.C. 1058a) because of the said emergency, the order for cancellation will be rescinded.

As explained in the notice of January 26, 1971 (882 O.G. 1342), applicants who may be entitled to earlier filing dates should note that a change in their U.S. filing date might, in turn, alter the date of expiration of the 6- and 12-month periods for filing applications abroad under provisions of the Paris Convention for the Protection of Industrial Property.

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Dated: July 14, 1971.

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

[FR Doc. 71-10469; Filed 7-22-71; 8:52 am]

36 F.R. 13694; July 23, 1971

Licensing Department Inventions

DEPARTMENT OF AGRICULTURE

Pursuant to authority delegated by the Secretary in 7 CFR 19.3 (35 F.R. 7493), the Administrator of the Agriculture Research Service has determined that certain Department inventions shall be made available for exclusive licensing under the provisions of Government Patent Policy (28 F.R. 10943) and 7 CFR 19.5 (35 F.R. 7493) and has made an initial selection of exclusive licensees involving four inventions. In accordance with 7 CFR 19.5(d) (35 F.R. 7493), notice thereof is published as follows:

1. Identifications of Department inventions: (1) Process for Making Powdered Fruit Juices, U.S. Patent 2,816,039; (2) Process for Making Full-Flavored Powdered Fruit Juice, U.S. Patent 2,816,840; and (3) Process for Dehydrating Liquid Foodstuffs with Preservation of Volatile Flavors, U.S. Patent 2,906,630.

Identification of the contemplated licensee: Welch Foods, Inc., Westfield, New York.

Terms and conditions of contemplated license: (1) The license will be granted to make, use, and sell the inventions to an unlimited field of use throughout the United States of America, its territories and possessions; (2) The period of the license will be three years, three months for Patents 2,816,039 and 2,816,840; and five years for Patent 2,906,630; (3) The maximum price of sale for the products of the inventions will not be fixed by the Administrator; (4) The license will not require the payment of royalties; (5) The license will permit the licensee to grant sublicenses; and (6) All other terms and conditions shall be in accordance with requirements specified in 7 CFR 19.5(c) (35 F.R. 7493).

2. Identification of Department invention: Cycloheximide as an Abscission Aid in Harvesting Citrus Fruit, patent application S.N. 865,199, filed October 8, 1969.

Identification of contemplated licensee: The Upjohn Company, Kalamazoo, Michigan.

Terms and conditions of contemplated license: (1) The license will be granted to make, use, and sell the invention in an unlimited field of use for citrus throughout the United States of America, its territories and possessions; (2) The period of the license will be five years from the date of issuance; (3) A maximum price of sale for the products of the invention will not be fixed by the Administrator; (4) The license will not require the payment of royalties; (5) The license will permit the licensee to grant sublicenses; and (6) All other terms and conditions shall be in accordance with requirements specified in 7 CFR 19.5(c) (35 F.R. 7493).

The license(s) will be granted unless:

(1) A nonexclusive licensee of the invention(s) files a protest with the Administrator within 30 days after this publication, stating that he has already brought or is likely to bring the invention(s) to the point of practical application without an exclusive license, and submitting documentation in support thereof; or

(2) An application for nonexclusive license on the invention(s) is filed with the Administrator within 30 days after this publication, such application stating that the applicant is likely to bring the invention(s) to the point of practical application without an exclusive license, and containing documentation in support thereof; or

(3) A protest is filed by any person with the Administrator within 30 days after this publication, setting forth reasons why it would not be in the public interest to grant the proposed exclusive license(s).

The Administrator shall make a decision with respect to any application or protest under subparagraphs (1), (2), and (3) above, which decision shall be final and conclusive unless appeal is made therefrom as provided in 7 CFR 19.11.

This notice has been published in the Federal Register, Wednesday, Aug. 4, 1971 (36 F.R. 14340), and became effective on that date.

T. W. EDMINSTER,
Acting Administrator, Agricultural Research Service.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,544,246, G. H. Butterfield, CORNEAL CONTACT LENS, **filed** Apr. 10, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c852, *George H. Butterfield, Sr.* v. *Tower Optical Co., Inc.* Voluntary dismissal, Aug. 26, 1970. **Same, filed** Mar. 20, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c675, *George H. Butterfield, Sr.* v. *Laverne R. Chavin, doing business as Hansen Optical Company.* Order action dismissed without prejudice, Sept. 18, 1970.

2,547,648, A. V. Loughren, AUTOMATIC CONTRAST CONTROL SYSTEM FOR TELEVISION APPARATUS, **filed** Nov. 20, 1959, D.C., N.D. Ill. (Chicago), Doc. 59c1847, *Hazeltine Research, Inc.* v. *Zenith Radio Corporation.* Final judgment, U.S.D.C. is affirmed, Apr. 30, 1971.

2,723,327, C. E. Gilbert, LINE CORD SWITCH, **filed** Sept. 8, 1969, D.C., E.D.N.Y. (Brooklyn), Doc. 69-C-1128. *Gilbert Manufacturing Co., Inc.* v. *Leviton Manufacturing Co., Inc.* Order of Dismissal without prejudice, Mar. 3, 1971.

2,765,202, Barr, Herrmann and Henwood, CAGE TYPE ROLLER BEARINGS AND METHOD OF ASSEMBLING ROLLERS THEREIN, **filed** Nov. 22, 1961, D.C., E.D. Pa. (Philadelphia), Doc. 30552, *Roller Bearing Company of America* v. *Bearings, Inc.* Judgment was entered for defendant Bearings Inc. and against Roller Bearing Company of America, Mar. 15, 1971.

2,994,881, R. T. Kaufman, JOGGING AND STAPLING MACHINE, filed Dec. 16, 1970, U.S. Ct. of Cl., Washington, D.C., Doc. 448–70, *Robert T. Kaufman* v. *The United States of America.*

3,100,909, A. Schapiro, AGGLOMERATED FOOD PRODUCT AND METHOD FOR MAKING THE SAME, filed Mar. 15, 1971, D.C., N.D. Calif. (San Francisco), Doc. C–71–486–LHB, *Abraham Schapiro* v. *Protein Instantizers, Inc.*

3,179,026, A. F. Crone, SEALING ELEMENT FOR PAVEMENT GROOVES, filed Apr. 29, 1966, D.C., N.D. Ohio (Toledo), Doc. C–66–89, *Acme Highway Products Corporation* v. *The D. S. Brown Company and Delmont D. Brown.* Case remanded to this court for further trial, Mar. 19, 1971, from the U.S. Court of Appeals, Sixth Circuit, Cincinnati.

3,401,944, J. S. De Metrick, TAPE CARTRIDGE INSERT, filed Apr. 2, 1971, D.C., S.D.N.Y., Doc. 71–C–1501, *Automatic Radio Mfg. Co. Inc.* v. *Orion Electric Corp. Ltd.*

3,404,334, C. L. Marshall, COLOR TELEVISION TEST APPARATUS, filed Mar. 15, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71–C–282, *Cecil L. Marshall* v. *EBY Sales Co.*

3,408,306, F. J. Boylan, METHOD OF CONTROLLING FOAMING, filed Mar. 29, 1971, D.C. Minn. (Minneapolis), Doc. 4–71–C–132, *United States Movidyn Corp.* v. *Hercules, Inc.*

3,452,895, K. U. Kalkowski, UTENSIL FOR PREVENTING SPRAYING WITH FRYING PANS, COOKING POTS OR THE LIKE, filed Mar. 25, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c743, *Kurt Ulrich Kalkowski* v. *Ronco, Inc.*

3,459,614, U. D. Polly, METHOD FOR MAKING PLASTIC ARTICLES, filed Feb. 12, 1970, D.C., S.D. Fla. (Miami), Doc. 70–184–WM, *Consolidated Productions, Inc.* v. *GEPCO, Inc.* Judgment by consent, plaintiff owner of said patent, which is valid and infringed, Feb. 12, 1971.

3,464,150, N. Troy, ROTATABLY SUPPORTED DOLL'S HEAD, filed Mar. 16, 1971, D.C., S.D.N.Y., Doc. 71–C–1207, *Nasco Doll Inc.* v. *Jolly Toys Inc.*

3,464,335, G. Irwin, CAMERA WITH FLASHCUBE MECHANISM, filed Mar. 30, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–782–AAH, *Puretec, Inc.* v. *Imperial Camera Corporation.*

3,484,785, J. G. Fanelli, ELECTRIC TERMINAL ADAPTER, filed Apr. 2, 1970, D.C., N.D. Ind. (South Bend), Doc. 70S36, *Coleman Cable & Wire Company* v. *M.H.R.V. Distributors, Inc.* Defendants having taken a license under the patent in suit, complaint is dismissed upon stipulation without prejudice, Mar. 15, 1971.

3,489,154, Kaspar and Ambrose, COMPOSITE SHEET MATERIAL AND GARMENTS MADE THEREFROM, filed Jan. 13, 1970, D.C. Conn. (New Haven), Doc. 13642, *International Playtex Corporation* v. *Bontex Corp. and The Howland-Hughes Company.* Consent judgment, plaintiff owner of said patent and defendant is enjoined from infringement, Feb. 2, 1971.

3,506,294, G. Newman, BUMPER GUARD ASSEMBLY, filed Feb. 5, 1971, D.C., S.D. Fla. (Miami), Doc. 71–185–C–CA, *Biscayne Mfg. Corp., etc.* v. *John Ridings, doing business as John Ridings Garage.* **Same,** filed Feb. 5, 1971, D.C., S.D. Fla. (Miami), Doc. 71–186–C–TC, *Biscayne Mfg. Corp., etc.* v. *Jay Lew Mfg. Corp., etc.*

3,515,234, Danford, Abbott, and Mitchell, TOBACCO HARVESTER, filed Mar. 11, 1971, D.C., E.D. Va. (Richmond), Doc. 185–71–R, *Harrington Manufacturing Company, Inc.* v. *Tilley's Machine and Welding Shop Inc.*

3,517,414, W. S. Carson, Jr., APPARATUS FOR PROCESSING PLASTIC MATERIAL, filed Jan. 22, 1971, D.C., W.D.N.C. (Charlotte), Doc. 2823, *Scottdel, Inc.* v. *Reeves Brothers, Inc.*

3,518,800, H. G. Tank, FLOORING SYSTEM, filed Aug. 21, 1970, D.C. Mich. (Marquette), Doc. 1391, *Connor Forest Industries* v. *Ahonen Lumber Company and Roy A. Ahonen.* Final judgment, defendants permanently enjoined, Mar. 17, 1971.

3,535,763, R. L. Helton, COMPONENT HANDLING TOOL FOR INSERTING DUAL-IN-LINE COMPONENTS INTO PRINTED CIRCUIT BOARDS, filed Apr. 15, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–900–CC, *Solder Removal Co.* v. *George D. Patrick, doing business as G. D. Patrick Enterprises.*

3,543,760, L. R. Bolduc, DISPOSABLE GROUND PLATE ELECTRODE, filed Mar. 12, 1971, D.C., N.D. Calif. (San Francisco), Doc. C–71–482, *Medical Plastics, Inc.* v. *Eugene W. Olsen, doing business as Olsen Surgical Service.*

3,544,013, D. Dorfman, SOIL TREATING APPARATUS, filed Jan. 11, 1971, D.C.N.J. (Newark), Doc. 47–71, *Lawn-A-Mat Chemical & Equipment Corporation* v. *Lawn King, Inc.*

3,548,534, Beny, Meggs, and Ryan, MOVING APPARATUS FOR A VEHICLE TOY, filed Feb. 18, 1971, D.C., S.D.N.Y., Doc. 71–C–716, *Mattel, Inc.* v. *Topper Corporation.*

3,553,374, Wolf and Marino, ACOUSTIC COUPLER, filed Feb. 18, 1971, D.C.N.J. (Trenton), Doc. C–222–71, *Digitronics Corporation* v. *MSI Data Corporation.*

3,563,134, H. B. Rodstein, AIR-OPERATED TOOL, filed Mar. 8, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–531–DWW, *Mayview Corp.* v. *Harvey B. Rodstein, Rodac Pneumatic Tools, Inc. and Rodac International Corp.*

Re. 25,011, J. P. Barkdoll, TYPEWRITER HAVING POWER OPERATED INSTRUMENTALITIES, filed Feb. 2, 1971, D.C., S.D.N.Y., Doc. 71–C–445, *SCM Corporation* v. *Nippo Machine Co. Ltd.* Final judgment on consent, defendants have infringed, May 7, 1971.

Re. 26,787, J. R. Winegard, ULTRA-HIGH FREQUENCY FISHBONE TYPE TELEVISION ANTENNA, filed June 10, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c1231, *Winegard Company* v. *The George Company et al.* Consent decree, dismissed with prejudice, Mar. 29, 1971.

Certificates of Correction for the Week of Sept. 7, 1971

3,330,686	3,559,999	3,569,765	3,575,521
3,336,244	3,560,390	3,569,878	3,575,598
3,408,916	3,560,620	3,569,942	3,575,636
3,483,225	3,560,807	3,570,096	3,575,764
3,487,096	3,561,290	3,570,301	3,575,882
3,514,440	3,561,494	3,570,421	3,575,900
3,515,583	3,561,919	3,570,573	3,576,494
3,530,113	3,562,369	3,571,604	3,576,551
3,531,738	3,563,212	3,571,841	3,576,563
3,534,477	3,563,419	3,571,943	3,576,569
3,538,205	3,563,893	3,571,958	3,576,700
3,542,887	3,564,016	3,572,032	3,576,908
3,544,982	3,564,063	3,572,151	3,577,167
3,544,991	3,564,170	3,572,571	3,577,376
3,545,297	3,564,425	3,572,762	3,577,484
3,547,629	3,565,090	3,572,836	3,577,603
3,548,965	3,565,558	3,572,880	3,577,825
3,549,463	3,565,567	3,573,230	3,577,915
3,549,540	3,566,111	3,573,276	3,577,976
3,551,571	3,566,155	3,573,671	3,578,095
3,554,141	3,566,361	3,573,700	3,578,383
3,554,416	3,567,057	3,574,121	3,578,764
3,554,493	3,567,612	3,574,187	3,578,790
3,554,738	3,567,749	3,574,189	3,578,875
3,555,194	3,567,831	3,574,505	3,579,038
3,555,614	3,568,160	3,574,799	3,579,150
3,556,693	3,568,239	3,574,902	3,579,396
3,557,782	3,568,299	3,574,958	3,580,955
3,558,271	3,568,830	3,575,296	3,581,658
3,558,337	3,569,676	3,575,363	3,582,291
3,559,447	3,569,736	3,575,394	3,582,624

Disclaimers

3,492,744.—*Louis E. Bernier,* Rockland, and *James P. Giblin,* Milton, Mass. GOLF SHOE AND BOTTOM THEREFOR. Patent dated Feb. 3, 1970. Disclaimer filed Dec. 18, 1970, by the assignee, *E. T. Wright & Co., Inc.*

Hereby enters this disclaimer to claims 2, 3 and 6 of said patent.

3,498,468.—*Russell C. Raynor,* South Salem, N.Y. SEDIMENTATION TANK. Patent dated Mar. 3, 1970. Disclaimer filed Mar. 4, 1971, by the assignee, *Dorr-Oliver Incorporated.*

Hereby enters this disclaimer to claims 35, 36, 37 and 40 of said patent.

3,526,150.—*Noel S. Iverson,* New Ulm, Minn. VARIABLE PITCH PULLEY. Patent dated Sept. 1, 1970. Disclaimer filed May 17, 1971, by the assignee, *New Ulm Manufacturing Company.*

Hereby enters this disclaimer to claims 1, 2, 3, 4 and 6 of said patent.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 24, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
* Date of Oldest Application (New)	
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-04-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	*3-05-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-15-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-03-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-24-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	12-11-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	*3-23-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-14-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-18-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	5-05-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	8-06-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	7-06-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	*5-14-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-04-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	9-11-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	7-10-70

Expiration of patents: The patents within the range of numbers indicated below expire during August 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,685,085 to 2,688,132, inclusive
Plant Patents..... Numbers 1,294 to 1,299, inclusive

PATENTS

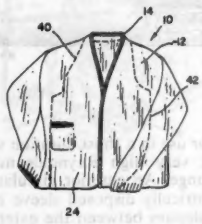
GRANTED SEPTEMBER 7, 1971

GENERAL AND MECHANICAL

3,602,913
FACIAL PROTECTION FOR HAIR SPRAY
Doris F. Neese, c/o Aima Neese, 2604 Burnett, Waco, Tex.
Filed July 22, 1969, Ser. No. 843,716
Int. Cl. A42b *1/00*
U.S. Cl. 2—9 **3 Claims**

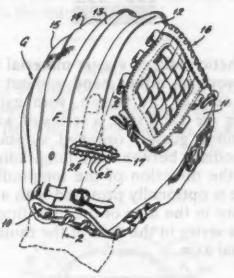
Apparatus for use by a person applying hair spray and the like to her own head to substantially prevent the spray from striking the face and injuring skin and the like.

3,602,914
METHOD OF SWEATER FABRICATION
Leo J. Castello, 3702 Burnett Lane, Huntingdon Valley, Pa.
Filed Dec. 15, 1969, Ser. No. 885,094
Int. Cl. A41d *1/04*
U.S. Cl. 2—90 **5 Claims**



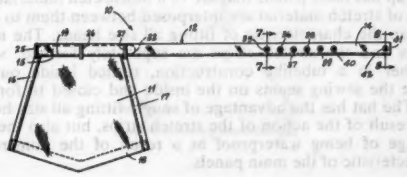
A method of fabricating a knitted panel or strip for use in manufacturing sweaters of the button or zipper-front type having a continuous knit on border with no seams on the neckline including the steps of knitting strips of cloth on a circular or flat bed machine having a continuous border at one edge thereof, folding the cloth double and placing a pattern thereon, cutting the doubled cloth to the pattern without interfering with the continuity of the border at the folded portion thereof, said border constituting said continuous knit on border in a sweater which is finished by utilizing the required cutting and sewing operations. The invention further includes the method of fabricating a knit pocket in the knit panel or strip including the steps of knitting an enclosed tubular stitch or pocket which is completely closed on all sides, utilizing any desired stitch to knit portions of said panel which extend from all sides surrounding said tubular stitch, severing the last course on top of said tubular pocket from the first needle or wale of said tubular course to the last needle or wale of said tubular course on one side only to provide a pocket opening, and applying any type of welt or edging to the marginal front edge of the pocket defined by the cut course.

3,602,915
BASEBALL MITT OR GLOVE
Paul F. Collins, Creve Coeur, Mo., assignor to A-T-O Inc., St. Louis, Mo.
Continuation-in-part of application Ser. No. 777,737, Nov. 21, 1968, now abandoned. This application Dec. 19, 1969, Ser. No. 882,775
Int. Cl. A41d *13/10*
U.S. Cl. 2—19 **6 Claims**



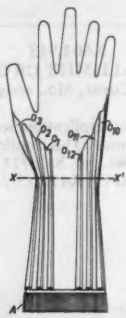
A baseball mitt or glove including a construction in which control over the position of the glove is enhanced by allowing a finger of the wearer of the glove to be exposed outside of the back of the glove body, without preventing the player from positioning the finger inside the glove when found desirable.

3,602,916
ADJUSTABLE APRON
Allyn J. Aach, Saint Louis, Mo., assignor to Angelica Corporation, St. Louis, Mo.
Filed Oct. 31, 1969, Ser. No. 872,831
Int. Cl. A41d *13/04*
U.S. Cl. 2—48 **8 Claims**



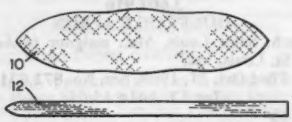
A size adjustment device comprising a single band adapted to be threaded through selected ones of a plurality of loops on a garment joined to the band to achieve coarse size adjustments. The band is then foldable back on itself and its free end is releasably engaged with one of a plurality of connectors for relatively fine size adjustments.

3,602,917
GLOVE IN PLASTIC OR ELASTIC MATERIAL WHICH MAY BE WORN ON EITHER HAND
Jean Jacques Seunevel, Neuilly Sur Seine, and Andre Veber, Drancy, both of, France, assignors to Propriete Industrielle et Developpment
Filed July 11, 1969, Ser. No. 845,666
Claims priority, application France, Nov. 23, 1966, 84,733
Int. Cl. A41d *19/00*
U.S. Cl. 2—167 11 Claims



Glove of synthetic resin or elastic material such as rubber, which may be worn on either hand without discomfort, including, in the area of the thumb, with extensions on the palm side and on the back side, a series of wide longitudinal undulations forming gussets oriented substantially along a direction intermediate between the longitudinal direction of the thumb and the direction of the longitudinal axis of the glove. The glove is optionally provided with an additional series of undulations in the area of the little finger substantially symmetric to the series in the area of the thumb, with respect to the longitudinal axis.

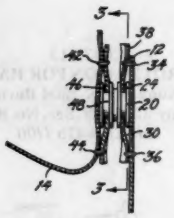
3,602,918
CAP
Joseph Krystal, 12 Sundale Gardens, Downsview, Ontario, Canada
Filed May 8, 1969, Ser. No. 822,932
Int. Cl. A42b *1/02, 1/04*
U.S. Cl. 2—197 1 Claim



A toque-type cap that is made substantially from a nonstretch material as distinct from a stretch rib-knit material. The cap has main panels that are of a nonstretch material but strips of stretch material are interposed between them to give the cap the characteristic of fitting all size heads. The main panels and the stretch strips are separately formed, sewn together in a tubelike construction, turned inside out to locate the sewing seams on the inside and closed to form a hat. The hat has the advantage of snugly fitting all size heads as a result of the action of the stretch strips, but also the advantage of being waterproof as a result of the nonstretch characteristic of the main panels.

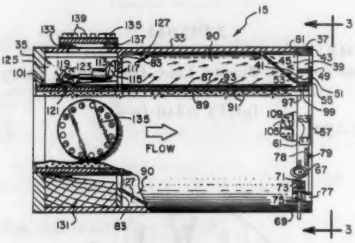
3,602,919
HEADPIECE AND SNAP-ON VEIL
Fred A. Piccione, Philadelphia, Pa., assignor to Alfred Angelo, Inc., Philadelphia, Pa.
Filed Sept. 16, 1969, Ser. No. 858,339
Int. Cl. A42b *5/00*
U.S. Cl. 2—207 8 Claims

Wearing apparel wherein a veil is removably coupled to a crownlike headpiece, the headpiece being itself separately wearable. A ruffled strip, bearing a plurality of spaced snap fasteners, is affixed to the headpiece, and a veil, which includes complemental snap fasteners, may be secured to the



fasteners associated with the headpiece. One edge of the strip projects upwardly beyond an upper edge of an opening in the headpiece, and hides the snap fasteners thereon from view when the veil is not used.

3,602,920
WIND TUNNEL TEST SECTION
John W. Davis, and Olen E. Hill, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Dec. 31, 1969, Ser. No. 889,557
Int. Cl. G01m *9/00*
U.S. Cl. 73—147 5 Claims

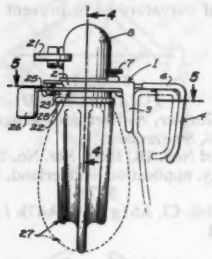


A test section for use in a short duration wind tunnel capable of simulating very high Reynolds numbers over the transonic speed range. An exterior circular tube contains a perforated concentrically disposed sleeve assembly forming an annular flow plenum between the exterior tube and the sleeve assembly. The main flow stream through the wind tunnel is through the sleeve assembly with "sucking off" from the main flow stream occurring through the holes in the walls of the sleeve assembly into the plenum. Flow into the plenum is adjustable to obtain the desired main stream flow velocity and the optimum cancellation of shock and expansion waves produced when the gas flow strikes the test model in the test section. The plenum flow is controlled by a rotatable ring at the downstream end of the test section.

3,602,921
BIDET ATTACHMENT
Harry M. Umann, Los Angeles, and Joseph D. Robinson, Gardena, both of, Calif., assignors to World Industries, Inc., Gardena, Calif.
Filed May 6, 1970, Ser. No. 35,080
Int. Cl. A47k *3/22, 11/08*
U.S. Cl. 4—7 6 Claims

A bidet attachment for toilets which includes a hand-operated pump which is removably attached to the side of a toilet bowl and a bidet nozzle which is removably attached to the rear side of the toilet seat, the pump and nozzle being

connected by a hose, and the pump being arranged to receive a removable, collapsible bag to provide a water supply. The hose is removable from the bidet nozzle for use with a douche tip.

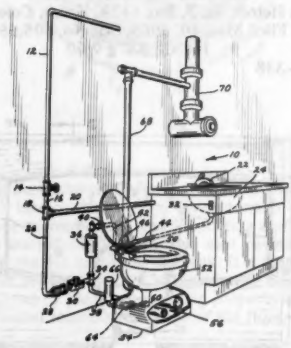


3,602,922

AUTOMATIC LAVATORY SYSTEM FOR SEWAGE DISPOSAL PUMPING UNIT

Arthur E. Broughton, Glens Falls, N.Y., assignor to Broughton Corporation, Glens Falls, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,289
Int. Cl. E03d *13/00, 11/08*
U.S. Cl. 4—100 4 Claims



Automatically actuated system for disposing of lavatory waste into a toilet bowl located below grade and having a sewage pumping and disposal system, said automatic system including a control unit responsive for actuation to a predetermined fluid level in the toilet bowl.

3,602,923

OPEN-TYPE URINE RECEPTACLE

Anthony S. Girala, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Aug. 13, 1970, Ser. No. 63,384
Int. Cl. E03d *13/00*
U.S. Cl. 4—110 7 Claims

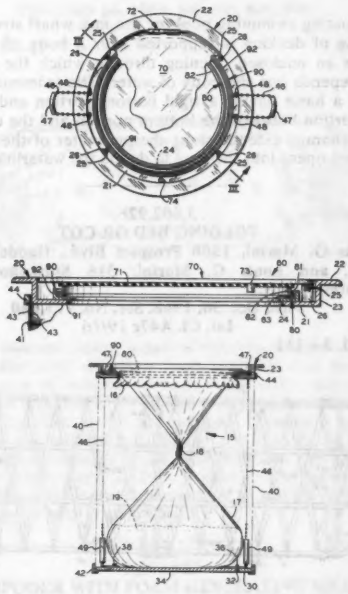
An open-type urine receptacle comprising a tubular housing having an inlet end and an outlet end. Disposed within the housing is a honeycomb insert for polarizing the urine stream in order to eliminate splashback. Supported on the honeycomb insert and at one end thereof is a fine mesh screen insert adapted to serve as a wicking means upon completion of micturition. A receptacle cover is also provided for covering the open end of the housing and a vacuum removal tube is connected to the other end and in fluid communication with the interior thereof.

3,602,924

COMMODE, STORAGE APPARATUS OR THE LIKE

Robert R. Kneisley, 2924 Cheltenham Road, Toledo, Ohio

Filed May 1, 1970, Ser. No. 33,839
Int. Cl. A47k *11/00, 13/24*
U.S. Cl. 4—142 26 Claims



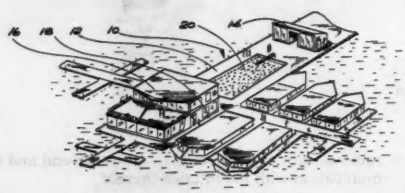
Apparatus suitable for use as a storage unit, commode, or the like which includes a support means having an inwardly extending flange defining an opening through the support, a retainer component having an opening formed therethrough and a width sufficient to permit the retainer component to rest on and be supported by the support flange with the respective openings thereof in registration, and a sacklike container disposed through the flange and retainer openings.

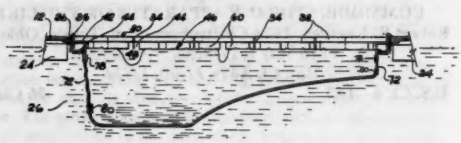
A top portion of the flexible container extends overly, outwardly, downwardly and under said retainer component between the retainer component and the flange thus removably securing the container to the support means. The weight of material in the container causes the container to pull down on the top of the retainer component thereby placing a greater securing force on the top portion of the container that is between the retainer component and the flange.

3,602,925
FLOATING SWIMMING POOL

Kenneth L. Thompson, Huntington Beach, Calif., assignor to Ye Dock Master, Inc.

Filed Aug. 25, 1969, Ser. No. 852,586
Int. Cl. A47k *3/00*; **E04h** *3/16, 3/18*
U.S. Cl. 4—171 **11 Claims**



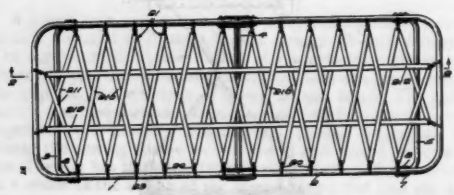


A floating swimming pool for use in a wharf structure. An expanse of decking is supported over a body of water and defines an enclosed opening through which the swimming pool depends into the body of water. The swimming pool includes a basin having a rigid bottom portion and a flexible wall portion between the bottom portion and the decking. A water channel extends along the perimeter of the swimming pool and opens into the pool to define the waterline thereof.

3,602,926
FOLDING BED OR COT

Thomas O. Marini, 1500 Prospect Blvd., Haddon Heights, N.J., and Louis G. Marini, 316 Springhouse Lane, Moorestown, N.J.

Filed Oct. 30, 1968, Ser. No. 771,890
Int. Cl. A47c *19/16*
U.S. Cl. 5—111 **4 Claims**

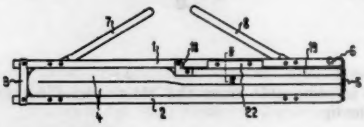


A foldable bed including at least two frame parts hingedly interconnected for folding movement toward and away from another between an extended in-use position and an upright storage position, there being a series of coil springs each connected at one end at similar intervals along the inner sides of the frame parts so as to be arranged in opposed pairs, a plurality of transverse resilient metal bands interwoven transversely of the major axis of the bed in extended position, at least two longitudinal resilient metal bands extending uninterruptedly from end to end of said frame parts, each band being connected to two coil springs and the longitudinal bands being interwoven with the transverse bands except those adjacent said hinge means so that when the frame parts are folded toward one another the longitudinal bands fold about such a radius of curvature as to prevent undue stressing or kinking.

3,602,927
FOLDABLE BED

Andre Wyss, Gorgier, Switzerland, assignor to La Beroche SA, Neuchatel, Switzerland

Filed Nov. 18, 1968, Ser. No. 776,385
Claims priority, application Switzerland, Nov. 24, 1967, 16 577/67
Int. Cl. A61g *9/00*; **A47k** *11/02*
U.S. Cl. 5—112 **6 Claims**

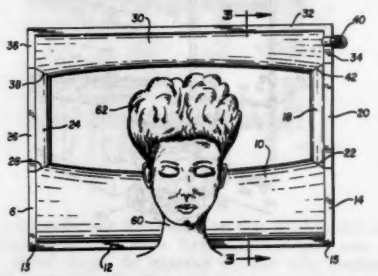


A foldable bed, particularly camping bed, having a mattress attached to two foldable frame portions connected to each other by a link member having a length substantially equal to double the thickness of the mattress such that the folded mattress is supported and protected between the spaced frame portions in the folded state of the bed.

3,602,928
PILLOW CONSTRUCTION

Florence V. Helzer, Rt. 3, Box 142A, Eaton, Colo.

Filed Mar. 10, 1969, Ser. No. 805,551
Int. Cl. A47g *9/00*
U.S. Cl. 5—338 **1 Claim**



An inflatable pillow having a central aperture is arranged for positioning under the neck and lower head of the user, maintaining the hair of the user in an elevated position to prevent crushing of the hairdo, and a surge chamber extending beyond the head of the user permits a flow of air into and out of a main portion of the pillow.

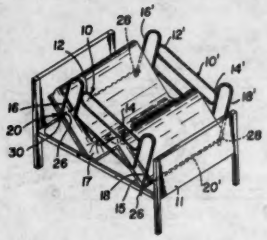
3,602,929
ADJUSTABLE BED RAIL UNIT

Charles E. Murcott, Huntington, and Arthur Salerno, Bay Shore, both of, N.Y., assignors to Lumex, Inc., Bay Shore, N.Y.

Continuation-in-part of application Ser. No. 820,441, Apr. 4, 1969, now abandoned. This application Mar. 2, 1970, Ser. No. 15,586
Int. Cl. A47c *21/08*
U.S. Cl. 5—331 **10 Claims**

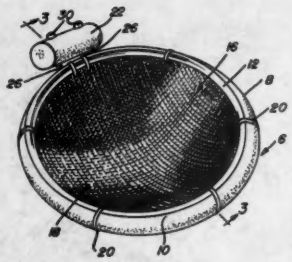
A guardrail unit for hospital beds or the like including an adjustable spring-loaded frame assembly for mounting on differently sized bed frames. The frame assembly includes a guide and clamping device for quick assembly and release

from the bed. The frame assembly has two telescoped axially movable tubular members arranged so that they must first be



rotated angularly with respect to each other in order to slide them inwardly of each other.

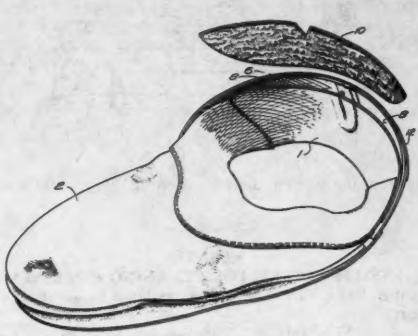
3,602,930
FLOATING SAUCER CHAIR
Robert M. Channon, 524 Leeridge Terrace, Glendale, Calif.
Filed Aug. 19, 1969, Ser. No. 851,175
Int. Cl. B63c *9/30*
U.S. Cl. 9—347 **4 Claims**



A relaxing, sunbathing and floating chair idealy suitable for use in a pool, lake or the like and characterized by a ringlike ethafoam float encompassing and supporting a polypropylene mesh basket constituting a seat. This seat permits the occupant to nestle therein and sit or lie back. It is form fitting and balanced with requisite nicety. A cushioned headrest is adjustably mounted by paired upstanding polyethylene tubes on a suitably selected segmental portion of the float.

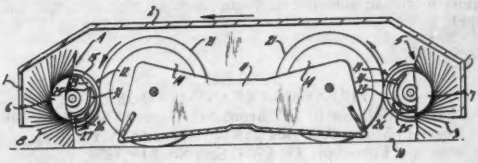
3,602,931
FELTED, FIBROUS, THERMOPLASTIC SHEET FIBREBOARD FOR MOLDING RIGID SHOE COMPONENTS AND METHOD OF MAKING THE SAME AND MAKING SAID COMPONENTS THEREFROM
David James MacArthur, Akron, Ohio, and Lawrence S. Reed, Jr., Holliston, Mass., assignors to George O. Jenkins Company, Bridgewater, Mass.
Continuation-in-part of application Ser. No. 727,237, May 7, 1968. This application Mar. 5, 1969, Ser. No. 816,140
Int. Cl. A43d *00/00;* **A43b** *13/42*
U.S. Cl. 12—146 **37 Claims**

A new thermoplastic fiberboard for molding while hot on the last or on a metal form, rigid shoe components, such as counters, box toes and shanks, particularly counters, and consisting essentially of water-laid, felted paper fibers having dispersed therethrough fine particles of hard thermoplastic resin. The fiberboard and resin are moldable at a temperature between 130° F and 170° F but the resin is not sufficiently flowable at that temperature for the resin particles to flow together into a homogeneous mass. The maximum and minimum ratios of fiber to resin are 70/30 and 50/50, respectively, and the resin is a mixture of rosin and hard tall oil pitch resin in a ratio of between 70/30 and 40/60. The fiberboard of the invention has the favorable moldability characteristics of resin saturated fabrics now used to mold such shoe parts on the last or on a metal form, but, unlike such saturated fabrics, has the hardness, toughness, strength



and resistance to crushing and breakdown characteristics of counterboard, which has been conventionally used to make such shoe parts, but the moldability characteristics of which are too poor to permit molding the shoe part on the last.

3,602,932
FLOOR SWEEPER WITH IMPROVED DRIVE COUPLING
William Morris, and Henry J. Rosendall, both of Grand Rapids, Mich., assignors to Bissel Inc., Grand Rapids, Mich.
Filed July 14, 1969, Ser. No. 841,370
Int. Cl. A47l *11/32*
U.S. Cl. 15—41 **6 Claims**

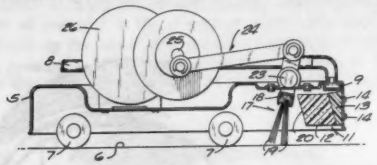


A floor sweeper having a pair of rotatable brushes, each of which is alternately driven or freely rotatable over the floor. The direction of rotation of each brush is the same at all times and is opposite to the direction of rotation of the other brush. A coupling device is connected between a sweeper wheel and the end of each brush, and includes a hollow coupling wheel having an open inner end and cam risers on its inner circumferential surface. A pawl is mounted to be engaged by the risers. Means are provided to seal the interior of the coupling from dust and debris.

3,602,933
SHAMPOOER WITH FOAM-GENERATING MEANS
Richard F. Druart, and Wallace D. Herrick, both of Grand Rapids, Mich., assignors to Bissell Inc., Grand Rapids, Mich.
Filed Aug. 8, 1969, Ser. No. 848,524
Int. Cl. A47l *11/03*
U.S. Cl. 15—50 R **9 Claims**

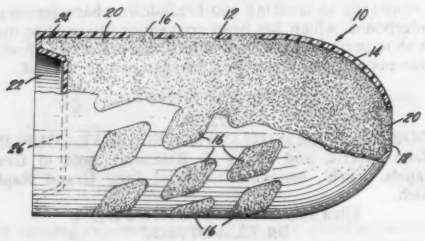
A shampooer for nap surfaces which supplies shampoo in liquid form to an elongated distributor. A rigid noncellular strip is mounted directly below the distributor, and a resilient sponge is secured to the strip. A brush is reciprocatingly

driven into beating squeezing engagement with the sponge to turn the liquid into foam. The brush then carries the foam



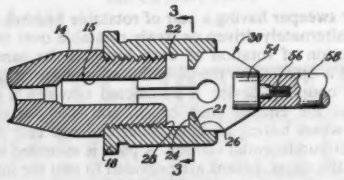
away from the sponge, deposits it on the carpet and works it in.

3,602,934
RESILIENT PLUG FOR CLEANING PIPELINES
Bryant B. Reed, Fort Worth, Tex., assignor to Acushnet Company
Filed July 31, 1969, Ser. No. 889,020
Int. Cl. B08b *9/04*
U.S. Cl. 15—104.06 R **9 Claims**



An improved pipe-cleaning resilient plug is provided which comprises an elastomeric shell with at least one opening therein and an elastomeric foam filler positioned within the shell.

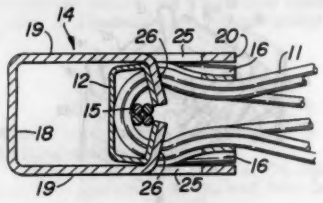
3,602,935
FIREARMS-CLEANING TOOL
Arthur G. McDonnell, 157 Brook St., Garden City, N.Y., and Roger L. Munz, P.O. Box 229A, Jamesport, N.Y.
Filed Apr. 25, 1969, Ser. No. 819,212
Int. Cl. B08b *9/02*
U.S. Cl. 15—104.09 **9 Claims**



A rotatable scraping tool having a plurality of edge portions is provided for removing built-up carbon deposits from the interior of a firearm.

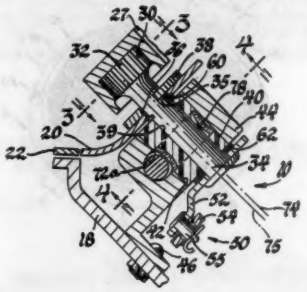
3,602,936
ROTARY BRUSH SECTION
Arthur E. Drumm, Rte. 1, Marysville, Ohio
Filed Sept. 30, 1969, Ser. No. 862,256
Int. Cl. A46b *13/02*
U.S. Cl. 15—181 **5 Claims**

A rotary brush section of the type mounted in suitable numbers on a central core to be driven thereby for heavy duty sweeping, such as street or industrial sweeping purposes. It comprises a split ring which receives and retains heavy radially extending bristles, and a connection for the split ring



which not only serves as a connection but as a driving lug to be engaged by the core.

3,602,937
ADJUSTABLE DRIVE PIVOT MOUNTING FOR WINDSHIELD WIPER
Oliver K. Kelley, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 13, 1970, Ser. No. 27,596
Int. Cl. B60s *1/34*; **F16d** *1/06*
U.S. Cl. 15—250.13 **5 Claims**

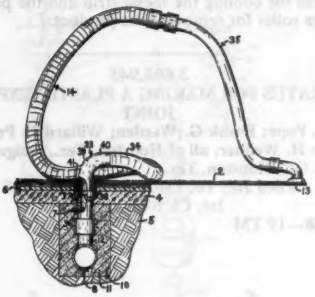


In a preferred form, this disclosure relates to a windshield wiper mechanism for oscillating a windshield wiper across the outer surface of a windshield of a vehicle. The windshield wiper mechanism includes a support means which is adapted to be mounted on the vehicle, a bushing rotatably supported by the support means and having an axially extending eccentric opening therethrough, and a pivot shaft rotatably journaled in the eccentric opening and having one end connected to the wiper and its other end connected to a linkage for oscillating the pivot shaft. The windshield wiper mechanism further includes a means connected with the bushing for rotating the bushing relative to the support means to adjust the position of the pivot shaft relative to position of the operating linkage for the windshield wiper and thereby adjust the end position of the wiper relative to the side edge of the windshield pillar so that optimum visibility adjacent the windshield pillar can be provided.

3,602,938
VACUUM SYSTEM FOR REMOVING WATER FROM SYNTHETIC TURF
Edward W. Lindsay, Ponca City, Okla., assignor to Vacu-Maid, Inc., Ponca City, Okla.
Filed Oct. 29, 1969, Ser. No. 870,578
Int. Cl. A47l *5/38*
U.S. Cl. 15—314 **11 Claims**

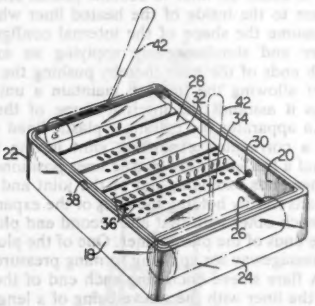
A vacuum system for removing water from large areas such as outdoor athletic fields, such as for football, baseball, soccer and the like having a covering of synthetic turf or the like. The system has a plurality of inlets arranged in spaced apart relation over the areas and below the level of the synthetic turf and supporting pad and connected to vacuum lines below the turf, pad and base for same for receiving

water through the inlets and conveying the water to a holding tank. Each inlet has a closure valve selectively opened for drawing water thereinto. Suction apparatus is connected to a tank for creating a vacuum in hose means connected to the



inlets for collecting water and moving same to the tank. A collection unit is positioned between the tank and the suction apparatus for receiving and holding material not deposited within the tank.

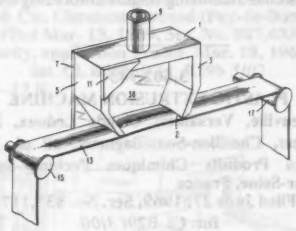
3,602,939
NOVEL PAINT CONTAINER
Daniel Schoenholz, Far Rockaway, N.Y., assignor to Foster D. Snell, Inc., Florham Park, N.J.
Filed Aug. 29, 1969, Ser. No. 854,131
Int. Cl. B44d *3/12*
U.S. Cl. 15—257.06 **5 Claims**



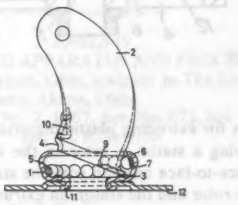
A paint container which not only acts as a storage means but can also be used to apply the paint therein to the desired surface with a roller or pad applicator without the inconvenience of the separate paint tray heretofore used with rollers while avoiding the transfer of small quantities of paint from the storage container to the paint tray.

3,602,940
MAGNETIC RECORDING TAPE CLEANER
Raymond A. Barbeau, and Edward J. Wroblewski, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 16, 1968, Ser. No. 783,926
Int. Cl. A47l *5/00;* **G11b** *3/58*
U.S. Cl. 15—308 **3 Claims**

A magnetic recording tape cleaner comprises an element with a tape wiping surface. Tapes are cleaned by passing them over the surface which scrapes unwanted recording material particles from the tape surface. As these particles accumulate primarily at the edges of the tape, the wiping surface is curved to apply more wiping pressure to the edges of the tape than the center thereof.

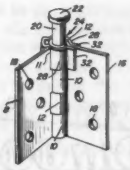


3,602,941
CASTER WHEEL ARRANGEMENT
Gunnar Erik Werner Lewin, Stockholm, Sweden
Filed Mar. 9, 1970, Ser. No. 17,716
Claims priority, application Sweden, Mar. 11, 1969, Dec. 31, 1969, 3315;18,158
Int. Cl. B60b *33/00*
U.S. Cl. 16—21 **10 Claims**



A caster wheel arrangement in which the caster wheel is rotatably supported by ball bearings mounted in a ball bearing race, at least one portion of which is located at a horizontal level vertically displaced from the horizontal level of the remaining portion or portions of the ball bearing race, all portions of the race being interconnected to form one continuous race.

3,602,942
DOOR HINGE STOP
Edsel B. Neff, Sr., 29 Del Norte, and Linton L. Miller, 505 Fulkerson Drive, both of Roswell, N. Mex.
Filed Sept. 26, 1969, Ser. No. 861,439
Int. Cl. E05d *11/06*
U.S. Cl. 16—191 **5 Claims**



A readily applicable and removable self-contained butt hinge attachment which serves as a limit stop, that is, functions to check the angular spreading movement of the knuckle-equipped leaves. It comprises a C-shaped resilient clip conformingly slipped into place over either one (top or bottom) of the pintle-accommodating knuckles. The bight portion of the clip is formed with a projecting riblike stop shoulder. The spaced edges diametrically opposite the stop

shoulder have flat liplike outstanding flanges which straddle and yieldingly contact the leaf which is sandwiched therebetween. An optional split spring-biased ring encircles the pintle and has stabilizing fingers embracing the respective flanges.

3,602,943

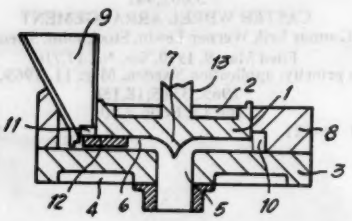
PLASTIC EXTRUSION MACHINE

Bernard Neuville, Versailles; Claude Ledoux, Massy, and Raoul Hess, Chatillon-Sous-Bagneux, all of, France, assignors to Produits Chimiques Pechiney-Saint-Gobian, Neuilly-sur-Seine, France

Filed June 27, 1969, Ser. No. 837,117

Int. Cl. B29f *3/00*

U.S. Cl. 18—12 C **12 Claims**



Apparatus for extruding plastic materials which includes a housing having a stator, a rotor in the form of a plate arranged in face-to-face relation with the stator to define a gap between the rotor and the stator, an extrusion opening axially through the rotor, means to rotate the rotor relative to the stator, an annular channel defined by the housing and means to sweep the volume of the annular channel whereby plastic is displaced toward the extrusion opening.

3,602,944

APPARATUS FOR THE MANUFACTURE OF SYNTHETIC LEATHER

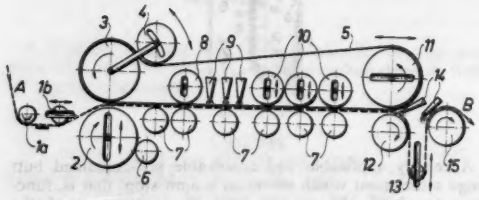
Gyorgy Szabo, and Sandor Toth, both of Gyor, Hungary, assignors to Llcencia Talalmanyokat Ertekesito VAllalat, Budapest, Hungary

Filed Jan. 28, 1970, Ser. No. 6,422

Claims priority, application Hungary, Jan. 30, 1969, SA-1928

Int. Cl. B29c *15/00*; B29d *7/14*; B29c *17/00*

U.S. Cl. 18—13 R **1 Claim**



An apparatus for the manufacture of synthetic leather by forming a superficial film layer from the surface of a fiber layer comprising thermoplastic fibers or from a thermoplastic powder or granulate applied onto a carrier or fiber layer. The apparatus comprises a feed and tensioning unit, a support roller, a heating roller, an endless metal strip guided between the support roller and heating roller, a guiding roller for guiding and tensioning the metal strip, means for cooling the melt, means for cooling the metal strip and the product, and a discharge roller for removing the product.

3,602,945

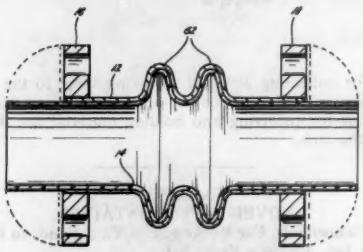
APPARATUS FOR MAKING A PLASTIC EXPANSION JOINT

Gerald R. Pope; Frank G. Weeden; Willard L. Petrosky, and William H. Wehner, all of Houston, Tex., assignors to John L. Dore Co., Houston, Tex.

Filed July 16, 1969, Ser. No. 842,185

Int. Cl. B29c *17/04*

U.S. Cl. 18—19 TM **3 Claims**



Making a plastic expansion joint having not more than two convolutions with a uniform wall thickness by inserting a hollow plastic liner into a molding member and applying heat sufficiently to cause the liner to become pliable and applying fluid pressure to the inside of the heated liner whereby the liner will assume the shape of the internal configuration of the member and simultaneously applying an axial force against both ends of the liner thereby pushing the liner into the member allowing the liner to maintain a uniform wall thickness as it assumes the internal shape of the molding member. An apparatus for making a plastic-lined expansion joint from a corrugated expansion joint having flanges at each end and a heated hollow plastic liner positioned therein with the liner ends extending out of the joint and including support means fixedly holding the ends of the expansion joint relative to each other with first and second end plugs engaging opposite ends of the plastic liner. One of the plugs including an air passageway for applying forming pressure inside of the liner. A flare sleeve encircling each end of the liner for supporting the liner with the sleeve being of a length to provide a length of tubing at each end for forming a liner-sealing flange, and a sealing clamp clamping the ends of the liner to the end plugs preventing loss of fluid pressure from the liner interior.

3,602,946

APPARATUS FOR HEAT-SHAPING THIN-WALLED CONTAINERS OF PLASTICS MATERIAL

Glauco E. Curetti, Zurich, and Ernest A. Ackermann, Chene-Bourg-Geneva, both of, Switzerland, assignors to Hoffco S.A., Geneva, Switzerland

Filed Mar. 3, 1969, Ser. No. 803,743

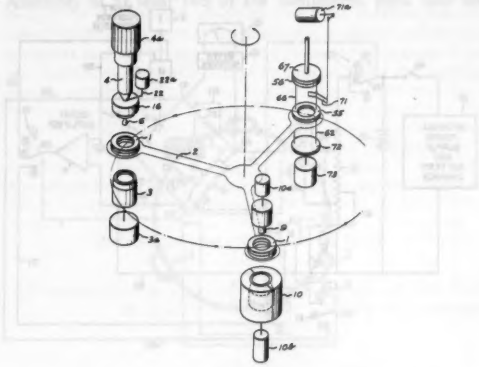
Claims priority, application Switzerland, Mar. 7, 1968, Dec. 20, 1968, Jan. 24, 1969, 3,527/68;19,069/68;1,067/69

Int. Cl. B29c *3/02*

U.S. Cl. 18—20 B **14 Claims**

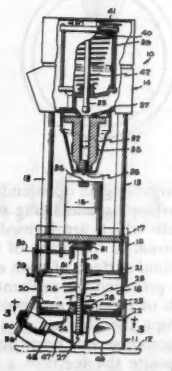
This invention relates to an apparatus for heat-shaping thin-walled containers of plastics material, which performs the injection of a plastics material volume in a preform having a greater capacity than this volume, the compression of said volume of plastics material to form a membrane fastened on a transfer ring through its periphery, the transfer of said

ring provided with the membrane to a heat-forming station when the container is formed out of said membrane and



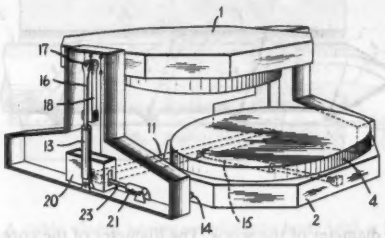
finally the transfer of the ring with the plastics material scrap to a scrap-removing station.

3,602,947
AUTOMATIC CONTROL SYSTEM
Philip R. Morgan, Monrovia, Calif., assignor to Morgan Industries, Inc., Los Angeles, Calif.
Filed Feb. 5, 1969, Ser. No. 796,834
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 CK **6 Claims**



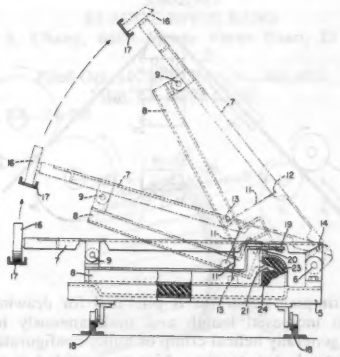
An automatic control system for an injection-molding machine or the like, including a first control valve for admitting actuating fluid to a clamping mechanism, to cause the latter to grip and hold a die or other work unit, and a second valve which is automatically actuable by pressure fluid from the clamping mechanism, when that mechanism reaches its clamping condition, to actuate an injection ram to inject a molding substance into the die. A time-delay unit accumulates pressure fluid within a timing chamber during the injecting portion of the cycle, and automatically returns the first-mentioned valve to closed or off position after a predetermined delay interval sufficient to complete the injection operation.

3,602,948
VULCANIZATION PRESS
Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale Des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand (Puy-de-Dome), France
Filed Mar. 13, 1969, Ser. No. 807,033
Claims priority, application France, Mar. 18, 1968, 144,296
Int. Cl. B30b *1/34*; B29b *5/02*
U.S. Cl. 18—17 K **3 Claims**



A vulcanization press has a fixed frame, a lower, horizontally movable mold plate secured to the frame, and an upper, vertically movable mold plate that can be closed with respect to the lower mold plate. The plates are clamped together in the closed position by a wedge cooperating with inclined thrust blocks, at least one thrust block being connected to each plate.

3,602,949
MOLDING APPARATUS AND PROCESS
George A. Kaut, Arkon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 2, 1967, Ser. No. 672,206
Int. Cl. B29c *5/00*
U.S. Cl. 18—39 **3 Claims**

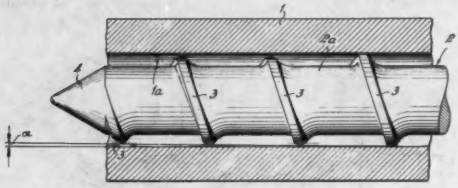


This invention relates to an apparatus for molding articles which tend to become die locked comprising a support for the mold and a lid support means which is pivotally mounted relative to said mold and support, said lid being pivotally mounted to the support to permit the lid to swing about an axis different from the pivot support whereby the lid may be mounted into closed and open positions relative to the mold.

3,602,950
INJECTION MOLDING MACHINE
Friedrich Bernd Bielfeldt, Pappenheim, Germany, assignor to Eckert & Ziegler GmbH, Weissenburg, Bayern, Germany
Filed Jan. 15, 1969, Ser. No. 791,331
Claims priority, application Germany, Jan. 19, 1968, P 17 29 152.0
Int. Cl. B29f *3/06, 3/08*
U.S. Cl. 18—12 SA **12 Claims**

An injection molding machine for thermosetting plastic material which comprises a heatable cylinder having a con-

stant internal diameter, and a rotary and axially movable screw which transports plastic material toward the outlet of the cylinder. The diameter of the screw thread decreases gradually toward the tip of the screw along an intermediate portion whose axial length is between one and eight times the

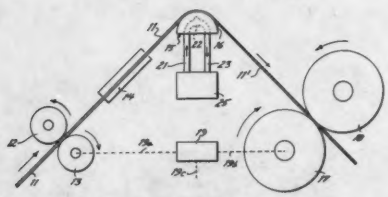


maximum diameter of the screw. The diameter of the core in the intermediate portion of the screw also decreases gradually but the pitch of threads on such intermediate portion increases toward the tip. This reduces wear on the internal surface of the cylinder and on the external surface of the screw.

3,602,951
APPARATUS FOR DRAW-CRIMPING TEXTILE STRANDS

Robert K. Stanley, Media, Pa., assignor to Techniservice Corporation, Kennett Square, Pa.

Continuation-in-part of application Ser. No. 476,933, Aug. 3, 1965, now Patent No. 3,505,444. This application Nov. 14, 1969, Ser. No. 876,661
Int. Cl. D02q *1/00*
U.S. Cl. 28—1.2 **16 Claims**



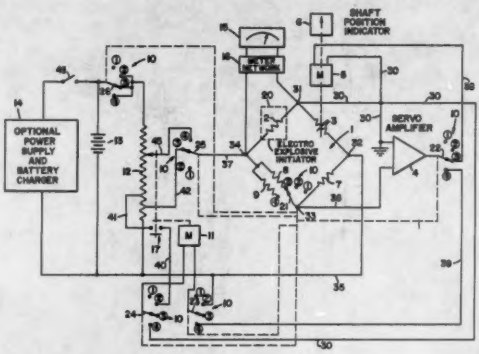
Draw-crimping apparatus is provided for drawing textile strands to increased length and simultaneously imparting thereto a generally helical crimp or bulky configuration when under relatively low tension. Also so provided is apparatus for uniform heating pretreatment or aftertreatment or both.

3,602,952
INSTRUMENT FOR MEASURING THRESHOLD VOLTAGE OF A SEMICONDUCTOR EXPLOSIVE INITIATOR

Stuart W. Grinnell, Menlo Park, and Robert F. Flagg, Castro Valley, both of, Calif., assignors to Kdi Halex Incorporated, Cincinnati, Ohio

Filed Aug. 18, 1969, Ser. No. 850,766
Int. Cl. G01r *27/02, 31/22*
U.S. Cl. 324—62 **3 Claims**

Nondestructively determining the turnover voltage of a semiconductor electroexplosive initiator. The initiator is inserted into a Wheatstone bridge as one arm thereof, and the bridge is balanced to the resistance of the initiator at room temperature. Then the bridge is unbalanced by multiplying the resistance of another bridge arm by a predetermined factor, and rebalanced by applying to the initiator an increasing voltage, held well below the threshold voltage, thereby heating the initiator to increase its resistance by the same predetermined factor. Then the value of the applied voltage

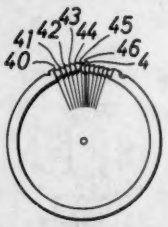


is read and converted to the value of the threshold voltage inherent in that semiconductor.

3,602,953
WIRE HOSE CLIP

Carl Thomas, Hamburg, Germany, assignor to Jurid Werke GmbH, Glinde near Hamburg, Germany

Filed May 26, 1969, Ser. No. 827,722
Claims priority, application Germany, May 29, 1968, P 17 50 722.1
Int. Cl. B65d *63/10*
U.S. Cl. 24—20 TT **8 Claims**



A wire hose clip comprising an open-ended ring of wire the ends of the wire overlapping and being provided with mutually engageable teeth which are formed on facing planar surfaces which lie normal to the plane of the ring, or which are provided on the total surface of each end of the wire. A safety sleeve may be provided for resiliently gripping round the interengaged ends of the wire and points of engagement for a tool for tightening the clip are provided adjacent the teeth. The clip may comprise two parts hinged together at a point in the ring opposite the teeth or a single part with a loop formed in the wire at a point in the ring opposite the teeth.

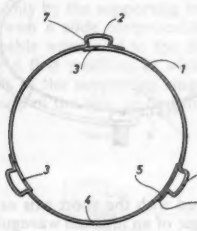
3,602,954
ANNULAR HOSE CLIP

Heinz Gerlach, 12 Billeweg, 2057 Wentorf, Germany

Filed Sept. 26, 1969, Ser. No. 861,324
Claims priority, application Germany, Oct. 31, 1968, P 18 06 247.0
Int. Cl. B65d *63/02*
U.S. Cl. 24—20 CW **1 Claim**

A simplified annular hose clip is constructed by two or more tab-shaped lug portions comprising separate, identical component parts, and one end of each of said component parts is formed as a lug portion while the other end of said component parts which serves as a clamping means is without any special design but has substantially the form of

the main portion of said component parts. The component parts are connectable to one another to form the hose clip in which each of the ends, which serve as the clamping means, lies under the lug portion of the adjacent component part. Assembly of at least two of the component parts into the



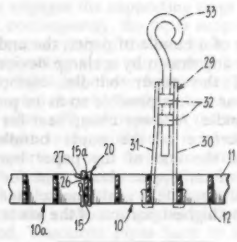
desired hose clip can be very easily achieved in such a way that the ends of the lug portion of any component part which overlie the other ends of the respective adjacent component parts, are securely fixed, e.g. by welding or otherwise connecting them to one another.

3,602,955

LIGHT LOUVER AND FASTENER THEREFOR

Robert A. D. Schwartz, 513 Independent Road, Oakland, Calif.

Division of Ser. No. 776,125, Nov. 15, 1968 Pat. No. 3,546,844.
Filed Mar. 20, 1970, Ser. No. 24,962
Int. Cl. A44b *21/00;* **E04c** *1/30*
U.S. Cl. 24—81 B **5 Claims**



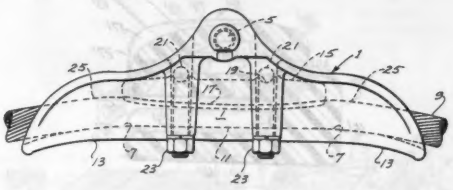
A louver structure comprised of a plurality of interconnected louver modules and providing an appearance of uninterrupted continuity throughout the entire extent thereof. Each louver module is rectangular and comprises a reticulated network of spaced transversely extending and longitudinally extending slats intersecting each other and defining spaces therebetween. The modules are identical and have perimetric edges adapted to overlie one another when a pair of modules are inverted relative to each other and are brought into contiguous juxtaposition along such edges. The corner portions of the modules are relieved to enable the various slats in any assembled plurality of modules to align with each other and thereby provide such appearance of uninterrupted continuity. Any pair of adjacent modules are interconnected along the contiguous overlying perimetric edges thereof by an integrally formed flexible fastener having an opening dimensioned to snugly receive such perimetric edges therein, and being provided with a discontinuity along one side enabling such perimetric edges to be inserted into the opening whereupon the fastener can be flexed to snap the same over such module edges to clamp the same together.

3,602,956

CABLE CLAMP

Fletcher C. Eddens, Mountainbrook, and Karl F. Reed, II, Homewood, both of, Ala., assignors to Anderson Electric Corporation, Leeds, Ala.

Filed Mar. 11, 1969, Ser. No. 806,216
Int. Cl. F16g *11/04, 11/06*
U.S. Cl. 24—125 M **8 Claims**



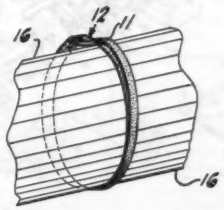
A cable clamp having an elongate body with a lengthwise groove for receiving the lower side of a cable tensioned under a force F_2, and an elongate keeper with an opposed lengthwise groove for application to the upper side of the cable. The lengthwise profile of at least one of these grooves is at least in part convex toward the other groove and when a cable is clamped between the body and the keeper the clamped portion of the cable is compressed and deformed with a total clamping force F_1. The curvature of the profile is such that under the forces F_1 and F_2 there are produced along the clamped length of the cable compressive and tensile stresses S_1 and S_2 which when combined according to the formula $(S_1+S_2\ /2)$ will produce throughout the clamped length of the cable a substantially constant value of shear stress S_3 which does not substantially exceed one-half the tensile stress in the cable outside the clamped length. A method for forming such a clamp is also described.

3,602,957

ELASTIC HOOK BAND

Robert S. Chang, 6600 Monte Verde Road, El Sobrante, Calif.

Filed Oct. 10, 1969, Ser. No. 865,409
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB **5 Claims**



An elastic loop or band having a metal or plastic element in the form of or formable into a hook extending from an outer surface thereof whereby the loop is extensible about one or more members to be held together and is attachable to itself without requiring extension over the ends of such members.

3,602,958

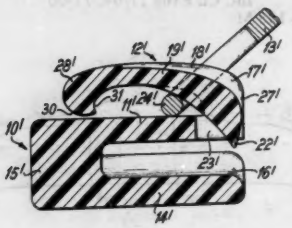
LOCK SLIDER

Friedrich Glindmeyer, Stolberg/Rheinland, Germany, assignor to William Prym-Werke KG., Rheinland, Germany

Filed Dec. 1, 1969, Ser. No. 881,060
Claims priority, application Germany, Nov. 29, 1968, P 18 11 663.7
Int. Cl. A44b *19/30*
U.S. Cl. 24—205.14 **7 Claims**

An automatic lock slider of plastic material provided with a bow-shaped combined holding and locking means compris-

ing an elongated lug integrally connected at least at one end thereof to the upper plate of the slider body for holding a pull tab, and resiliently bendable elongated detent means integrally connected at one thereof to the lug in the region of the other end of the latter and carrying on it its free end a locking tooth for locking engagement with the interlocking elements of a slide fastener.

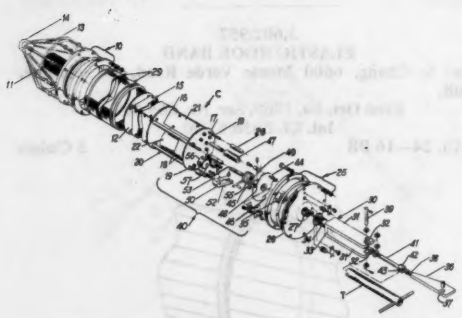


3,602,959

AUTOMATICALLY RELEASABLE CONNECTORS

George R. Perez, Alexandria, Va., assignor to AMF Incorporated

Filed Mar. 26, 1970, Ser. No. 22,759
Int. Cl. A44b *21/00*
U.S. Cl. 24—230 **8 Claims**



A connector device having a sealed pressure housing, a clevis and hook-type releasable coupling connected to one end of the housing, spring-biased rotatable control means in the housing and extending outwardly thereof to lock the hook against uncoupling when the control means is armed, electromagnetic locking means which when energized releases the control means for rotation by its bias to effect decoupling.

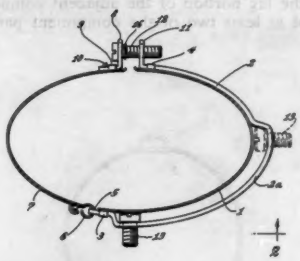
3,602,960

CLAMP FOR MOUNTING ELLIPTICAL WAVEGUIDES

Walter Urbigkeit, Berlin; Karl P. G. Baumann, Resse, and Guenter Ahrens, Langenhogen, all of, Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed June 8, 1970, Ser. No. 44,163
Int. Cl. A44b *21/00*; H01p *1/04*
U.S. Cl. 24—249 LS **9 Claims**

A clamp for mounting elliptical waveguides and having two complementary parts defining a cylinder with elliptical cross section. Fastening means on the clamp have contour in accordance with a larger ellipse and an oblong slot for a bolt which may be aligned with the short axis as well as with the long axis of the ellipse of an inserted waveguide.

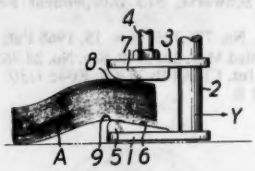


3,602,961

DEVICE FOR CLAMPING A BUNDLE OF PAPER

Seiya Shibata, Kitakawachi; Akitoshi Yamasaki, Toyonaka, and Isokazu Shimono, Osaka, all of, Japan, assignors to Tsubakimoto Chain Manufacturing Company, Limited, Osaka, Japan

Filed Dec. 11, 1969, Ser. No. 884,133
Claims priority, application Japan, Dec. 13, 1968, 43-109454
Int. Cl. A44b *21/00*
U.S. Cl. 24—262 R **1 Claim**



For the transfer of a bundle of paper, the end of the paper bundle is grasped and drawn by a clamp device. By utilizing the flexibility of the paper bundle, clamping pressure required is made as low as possible so as to protect the end portion of the bundle. A lower clamp seat for contact with the lowermost surface of the paper bundle is inclined downward toward the end of the paper bundle, while a pressing portion of an upper clamp seat for pressing the upper surface of the bundle is positioned closer to the end of the bundle than the highest portion of the lower clamp seat.

3,602,962

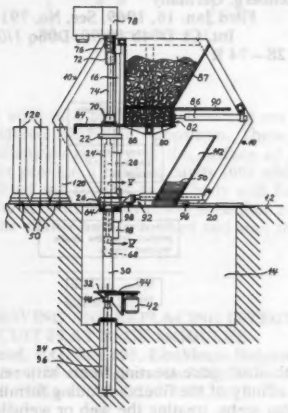
MACHINES FOR SIMULTANEOUS MOLDING OF A NUMBER OF CONCRETE PIPES

Magne Odegaard, and Sverre Narmo, both of Lena, Norway, assignors to Ringsted Jernstoberi & Maskinfabrik A/S, Ringsted, Denmark

Filed Feb. 3, 1969, Ser. No. 795,942
Claims priority, application Norway, Feb. 3, 1968, 431/68
Int. Cl. B28b *21/16*
U.S. Cl. 25—30 R **8 Claims**

A machine for the simultaneous molding of a number of concrete pipes, comprising a stationarily arranged table, a number of outer molds arranged in a row above said table each axially displaceable between a lower molding position and an upper idle position, in which the latter it is positioned at a distance above the table greater than the length of the pipes to be molded, for each outer mold a core having inner vibrating means and being displacable from a lower position, in which its uppermost end is positioned below the upper surface of the table, upwards through an opening in the table into the outer mold, when the latter is in its lower molding position, during which movement of the cores concrete is filled into the outer molds to fill up the mold spaces between

the same and the core. During the molding the lower end of each outer mold is closed by means of a supporting ring having a major outer diameter greater than the major diameter of the pipe to be molded and being arranged on the table prior to the downward displacement of the outer mold, so that, after the molding operation has been finished, and the outer molds have been displaced upwards again to their idle positions and the cores have been retracted downward from the molded pipe into their lower positions, each just molded pipe is supported only by the supporting ring. The machine is further provided with a slide reciprocably arranged on the table and displaceable transverse to the direction of the row of molds between a first position, in which its slide edge is positioned in front of the supporting rings, and a rear position at the other side of the row, so that during said displacement the slide engages the supporting rings and thereby slide the same and, consequently, the pipes supported by the rings, along the table rearwards in the machine, whereby the rings engage corresponding rings supporting previously molded pipes and are displacing these further supporting rings with the pipes supported thereby further ahead, whereby all previously molded pipes still positioned on the table or behind the same are brought to be collected in a close assembly, in which the supporting rings owing to their diameter being greater than the major diameters of the pipes, and in spite of engaging each other ensure sufficient space between the pipes to prevent the same in engaging each other and thereby being disturbed. Therefore pipes have to be removed from the machine only at great intervals in spite of a high capacity of the machine.



3,602,963

APPARATUS FOR PRODUCING BRICKS

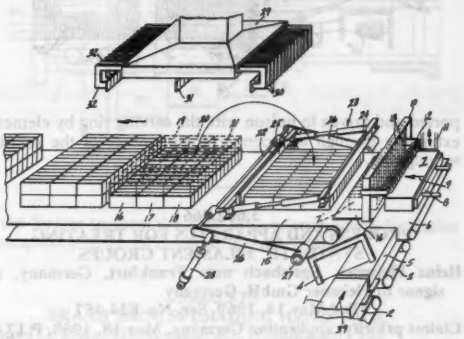
Johann Lingl, Finninger Strasse 70, Neu-Ulm, Danube, Germany

Division of Ser. No. 583,829, Oct. 3, 1966, Pat. No. 3,468,998. Filed July 28, 1969, Ser. No. 870,901

Int. Cl. B28b *13/04*

U.S. Cl. 25—105 **7 Claims**

Apparatus for cutting a continuous length or strand of compressed raw material as it comes from an extrusion press and then stacking the blocks or bricks thus cut so that the facing sides of the individual bricks lie in full engagement with each other for protection from discoloration when they are fired. The apparatus includes a pair of belt conveyors disposed in tandem for carrying the strand of material as it comes from the extruder and a cutter intermediate these first two conveyors for cutting the strand into sections. A third conveyor, which moves in the same direction as the first two, carries each section against a stop from which it is pushed laterally through a cutter frame that divides it into the desired number of bricks to form a row of such bricks. A fourth conveyor that operates intermittently is disposed at right angles to the others downstream of the cutter frame to receive the rows of bricks as successive sections are pushed through the cutter frame one after another, so that the rows of bricks coming from the cutter are pushed transversely onto the fourth conveyor. Two groups of rows are formed on this last conveyor and are spaced from each other so that the second one to be formed can be inverted onto the other by a turnover device such that the faces of the bricks in one group are accurately aligned in registry with those of the other group. A gripper assembly then picks up the double-layer flat of bricks thus formed and places it on a kiln car. As successive double-layer flats are formed they are stacked one on top of the other until a stack of the desired height is built on the kiln car.



3,602,964

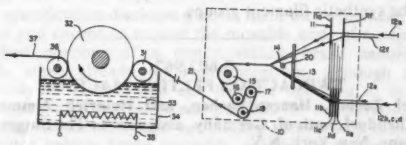
DUAL WALL FABRIC WITH EXPANDABLE HEIGHT BETWEEN LAYERS

Robert G. Currier, Roxboro; Carl R. Fonda, Durham, and John T. Hayes, Durham, all of, N.C., assignors to Collins & Aikman Corporation, New York, N.Y.

Filed Apr. 10, 1969, Ser. No. 815,076

Int. Cl. D02c *27/00;* **D06c** *1/00;* **D03d** *11/00*

U.S. Cl. 28—76 T **12 Claims**



A fabric is provided in the form of two simultaneously woven opposed fabric layers disposed in closely spaced relation with integrally woven connecting strands, with the fabric being adapted for expansion of the height between layers subsequent to the weaving operation.

3,602,965

APPARATUS FOR FORMING A NONWOVEN WEB OF CRISS-CROSS THREADS

William H. Burger, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

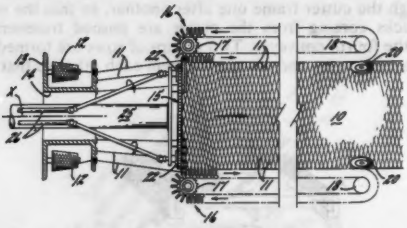
Filed June 17, 1969, Ser. No. 834,072

Int. Cl. D04h *3/05*

U.S. Cl. 28—1 **5 Claims**

An apparatus for forming a nonwoven web is disclosed in which a web carrier is formed by a pair of endless chains in which each link carries a thread-engaging hook. Individual threads fed from respective supply cones on a rotating serving ring are guided and engaged with the carrier hooks by means of an endless guide chain disposed on sprockets

spaced on opposite sides of the web to be formed, and having eyes through which the threads pass. The guide chain is supported and driven in unison with the serving ring by elements extending through an opening in the center of the rotating serving ring.



3,602,966

PROCESS AND APPARATUS FOR TREATING SYNTHETIC FILAMENT GROUPS

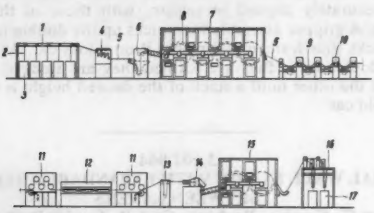
Heinz Fleissner, Egelsbach near Frankfurt, Germany, assignor to Fleissner GmbH, Germany

Filed May 14, 1969, Ser. No. 824,457

Claims priority, application Germany, May 18, 1968, P 17 60 452.3

Int. Cl. D02j *1/22*; D06p *3/00*; D02q *1/00*

U.S. Cl. 28—1.2 **23 Claims**



The present disclosure is directed to a process and apparatus for the continuous pad-dyeing or crimping of endless synthetic filament groups wherein the pad-dyeing process can be combined with fiber production and the drawing of the fiber filaments is effected after the application of the dyestuff to the synthetic filament groups.

3,602,967

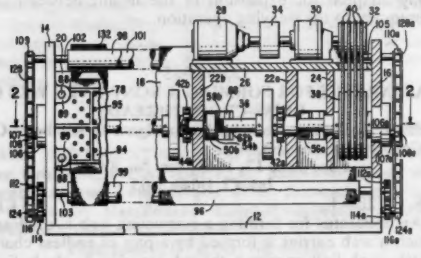
TWIN-ACTION FELTING MACHINE

Josef Zocher, Haaren/Aachen, and Heinrich Zimmerman, Eilendorf, both of, Germany, assignors to The Singer Company, New York, N.Y.

Filed June 1, 1970, Ser. No. 42,103

Int. Cl. D04h *18/00*

U.S. Cl. 28—4 R **7 Claims**



A needle-felting machine comprising two needle boards each having a multiplicity of barbed needles projecting from a surface thereof and disposed so that the needles in each board face away from the other board. The boards are arranged in linear opposition to each other and are reciprocably driven from a common drive shaft and gearing disposed intermediate the boards. A web of loosely matted fibers is fed past the needle surface of each board by a plurality of feed rolls driven from the common drive shaft and is simultaneously penetrated by the needles of both boards so as to obtain a balanced force system.

3,602,968

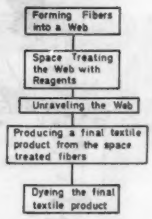
METHOD OF SPACE-TREATING FIBERS WITH REAGENTS TO CHANGE THE DYE AFFINITY OF THE FIBERS

Jurgen Martin Adolff, Backnang; Egbert Heintschel-Heinegg, Berlin, and Winfried Loskant, Backnang, all of, Germany, assignors to J. F. Adolff Aktiengesellschaft, Backnang, Wurttenberg, Germany

Filed Jan. 16, 1969, Ser. No. 791,609

Int. Cl. D04b *19/00*; D06q *1/02*

U.S. Cl. 28—74 R **10 Claims**


Forming Fibers into a Web
Space Treating the Web with Reagents
Unraveling the Web
Producing a final textile product from the space treated fibers
Dyeing the final textile product

A method of space-treating fibers with reagents to change the dye affinity of the fibers including forming the fibers in a flat web or webs, treating the web or webs with the reagents and unraveling the flat web or webs to separate the treated fibers such that the treated fibers may be formed into web goods and dyed to have various colors and patterns.

3,602,969

HINGE PINTLE REMOVING TOOL

Norwood E. Provost, 5710 Karen Drive, West Palm Beach, Fla.

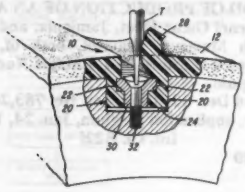
Filed Sept. 29, 1969, Ser. No. 861,616

Int. Cl. B25b *27/14*

U.S. Cl. 29—275 **2 Claims**

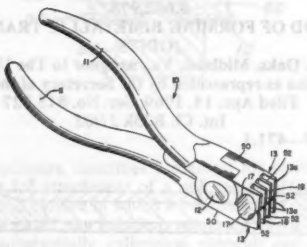
A handtool adapted to loosen and remove a headed pintle from a door hinge and primarily designed for carpenters. It comprises a one-piece tool embodying a shank having one end to receive intermittent blows from a hammer. The other end has a multipurpose head which embodies first usable means for prying and loosening the headed end of the pintle and second usable end thrust means releasably cooperable with the pintle in a manner to enable the user to drive and completely remove the pintle.

3,602,970
LATCH BAR ASSEMBLY FOR REPLACEABLE COVER
Charles E. Smith, Lutherville, Md., assignor to The Ward-Turner Machinery Company, Baltimore, Md.
Filed Apr. 14, 1969, Ser. No. 815,639
Int. Cl. B60b *7/00*
U.S. Cl. 29—118 8 Claims



The proximate ends of a plastic roll sheathing are formed with offset shouldered flanges in opposition. These flanges extend into a rectangular groove in the surface of the roll body and together provide a mortise cavity into which a T-shaped tenon is fitted and secured to the body with fasteners. At least one of the ends of the sheathing is further extended so as to overlay the clamp joint so formed and abut the other end.

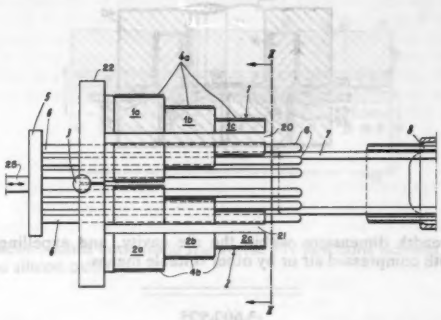
3,602,971
TOOL FOR REMOVING AND REPLACING INTEGRATED CIRCUIT FLAT PACK MODULES
William M. Halstead, P.O. Box 195, Linthicum Heights, Md.
Filed Nov. 25, 1968, Ser. No. 778,440
Int. Cl. H01r *43/00*; B25b *7/00, 7/02*
U.S. Cl. 29—203 H 3 Claims



A plierlike device having opposing jaws formed with complemental recesses to receive and clampingly hold the body of a module. The jaws are also formed with aligned slots which separate them into aligned jaw members, the jaw members being spaced so as to fit in spaces between connector prongs of the module body while the prongs project outwardly from the jaws through the slots.

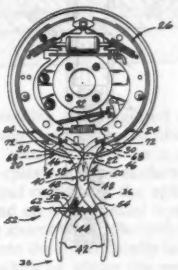
3,602,972
APPARATUS FOR FORMING AND TRANSFERRING COILS FOR STATORS
Hans Droll, Nording 75, Bergen-Enkheim, Germany
Filed Oct. 22, 1969, Ser. No. 868,371
Claims priority, application Germany, Apr. 17, 1969, P 19 19 433.3
Int. Cl. H02k *15/06*
U.S. Cl. 29—205 R 11 Claims

Apparatus including circularly arranged transfer bars movable to protrude axially from the front end of a former to automatically transfer wound coils from the former to mounting fingers of a device which inserts the wound coils in the stator grooves. A control device regulates feeding of wire



to the former to form the coils in a manner which facilitates subsequent transfer of the coils from the former.

3,602,973
BRAKE SHOE SPREADING HAND TOOL
Samuel G. Mata, 519 Neptune, #2, Wilmington, Calif.
Filed Apr. 10, 1968, Ser. No. 720,185
Int. Cl. B23p *19/04*
U.S. Cl. 29—227 4 Claims

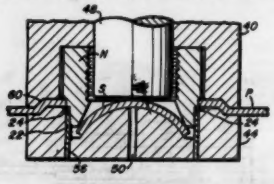


The specification discloses a novel hand tool which can be grasped and caused to engage the movable ends of a pair of brakeshoe portions of a motor vehicle brake assembly (usually when already removed therefrom, although not necessarily so limited) and can then be operated so as to spread apart said brakeshoe end portions for the purpose of facilitating the assembly and remounting thereof with respect to a motor vehicle brake assembly and the assembling and remounting with respect thereto of a conventional brakeshoe adjusting assembly (or for use in facilitating the reverse operation, although such is not the primary purpose of the tool). The tool, in one preferred form, is also provided with locking means for holding it in operated form with the brakeshoe portions held in spread-apart relationship for as long as is needed to facilitate the assembly and remounting operation (or disassembling and removing operation) referred to above.

3,602,974
PIERCE NUT FASTENING MEANS AND METHOD
Albert C. Koett, 2112 Glenside Ave., Cincinnati, Ohio
Filed Nov. 5, 1968, Ser. No. 773,577
Int. Cl. B23p *11/00*
U.S. Cl. 29—243.5 19 Claims

A pierce nut having a noncylindrical shank is driven through a sheet metal mounting plate into a die so as to excise a slug; further advancement of the nut into the die forces the shank of the nut through a sleeve of the die, to displace metal from the corners of the nut and compact the displaced

metal against the mounting plate for securing the nut thereon. Removal of the slug is facilitated by reducing its



breadth dimensions within the die cavity, and expelling it with compressed air or by other suitable means.

3,602,975

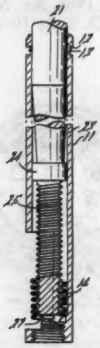
HELICAL COIL INSERT TOOL

Raymond L. Thurston, 1649 Tina Lane, Flossmoor, Ill., and Ronald E. Lang, 5472 Holly Road, Holly, Mich.

Continuation of application Ser. No. 570,935, Aug. 8, 1966, now abandoned. This application Nov. 14, 1968, Ser. No. 778,000

Int. Cl. B23p *19/04*

U.S. Cl. 29—240.5 **2 Claims**



The installation tool applies a helical coiled wire insert in the threaded aperture of an element by first applying it to a section of a thread in a sleeve to reduce its diameter before screwing it into the full thread of the sleeve and element.

3,602,976

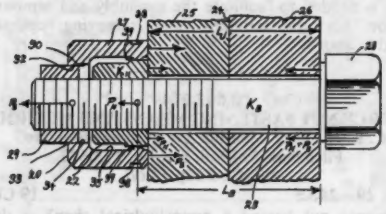
METHOD FOR CONTROLLING CLAMPING LOAD OF A THREADED FASTENER

William L. Grube, Lake Bluff, Ill., assignor to MacLean-Fogg Lock Nut Co., Mundelein, Ill.

Filed Sept. 15, 1969, Ser. No. 857,787

Int. Cl. B23q *17/00*

U.S. Cl. 29—407 **13 Claims**



A method of controlling or establishing, within close limits, the clamping load exerted on a workpiece or the bolt tension developed in a threaded fastener utilized for the securement of the workpiece, and wherein the construction and arrangement of the fastener parts sense variable fastener and workpiece characteristics in a manner such that compensation for such variable elastic characteristics can be made within close and consistent limits by a relatively fixed and readily repeatable final movement of one of the holding parts of the fastener.

3,602,977

METHOD OF PRODUCTION OF AN ALLOY

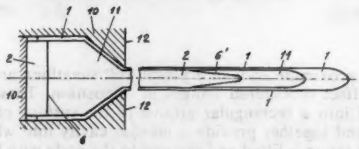
Jean-Jacques Henri Oscar Huet, Jamioulx, and Henry Berthe Marie Joseph Massaux, Stavelot, both of, Belgium, assignors to Centre D'Etude De L'Energie Nucleaire, C.E.N., Brussels, Belgium

Filed Dec. 12, 1968, Ser. No. 783,208

Claims priority, application Belgium, Jan. 24, 1968, 709,814

Int. Cl. B22f

U.S. Cl. 29—420 **2 Claims**



A method of production of an alloy wherein powders containing the constituents thereof are intimately mixed, the mixture thus obtained being charged inside a casing, closed with a cover recessed on the face facing the interior of the casing fitted with a bore, the assembly thus obtained being subjected to one compression operation, the bore in the cover being plugged, after which the compressed assembly is subjected to an extrusion operation, the outer layer being subsequently removed by a machining operation. The cover is produced from a metal which at extrusion temperature suffers less deformation than the mixture inside the casing.

3,602,978

METHOD OF FORMING BIMETALLIC TRANSITION JOINTS

William D. Oaks, Midland, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 14, 1969, Ser. No. 815,727

Int. Cl. B23k *31/02*

U.S. Cl. 29—471.1 **7 Claims**

Transition joints formed of dissimilar metals, such as stainless steel and aluminum, are produced by assembling an aluminum rod and two stainless steel plugs coaxially within a stainless cylinder with the plugs positioned at each end of the rod. Both plugs are welded to the cylinder and the assembly is then heated and subjected to reduction by rotary swagging thus forming a metallurgical bond of the two metals. The assembly may be machined into tubular joints by standard techniques.

3,602,979

BONDING OF REINFORCED TEFLON TO METALS

Felix P. La Iacona, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

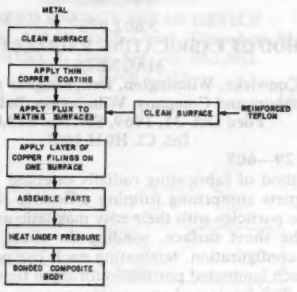
Filed Jan. 28, 1970, Ser. No. 6,610

Int. Cl. B23k *31/02*

U.S. Cl. 29—473.1 **12 Claims**

Reinforced FEP Teflon composite material is bonded to a metal substrate by applying a thin layer of copper on the metal surface, disposing irregularly shaped copper particles

on the coated surface, assembling the reinforced Teflon in contact with the particles and heating the assembly under pressure at an elevated temperature below the melting point



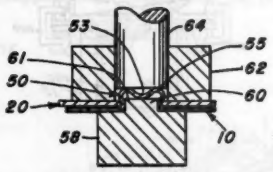
of the Teflon. A diffusion bond stronger than the reinforced Teflon component is produced, thus enabling the fabrication of self-lubricating bodies having relatively high strength.

3,602,980

METHOD FOR FORMING A SHEET METAL JOINT

Robert E. Heffner, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 23, 1968, Ser. No. 786,084
Int. Cl. B21d *39/00*; B23p *11/00*
U.S. Cl. 29—509 **3 Claims**



This disclosure describes a method for forming a sheet metal joint for attachment of a pull tab to a tear strip in a container end closure in which a bubble is first formed in the closure end panel, the bubble is reformed into a hollow rivet having a substantially cylindrical sidewall and an arcuate transverse end wall, and the rivet is staked or upset to compressively fold the transverse end wall thereof to form a head on the rivet which is at least as thick as the transverse end wall of the unstaked rivet.

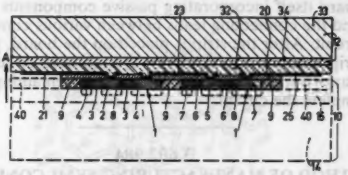
3,602,981

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE AND SEMICONDUCTOR DEVICE OBTAINED BY CARRYING OUT SAID METHOD

Else Kooi, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 17, 1968, Ser. No. 722,071
Claims priority, application Netherlands, May 13, 1967, 6706734
Int. Cl. B01j *17/00*; H01g *13/00*
U.S. Cl. 29—571 **4 Claims**

A method of making a monolithic semiconductor integrated circuit is described. On a thick silicon wafer is provided an oxidation mask in a desired pattern, and then the surface is thermally oxidized to sink into the silicon surface a sunken oxide pattern. Then impurities are introduced into the silicon surface regions to form PN junctions extending transversely to the surface. Next an insulating support is mounted on the wafer surface, and the backside is lapped or etched off until the sunken oxide pattern is reached forming



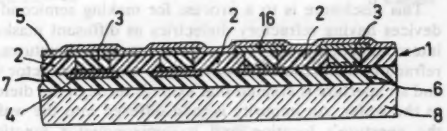
silicon islands containing transverse PN junctions isolated by the silicon oxide.

3,602,982

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE AND DEVICE MANUFACTURED BY SAID METHOD

Else Kooi, Emmasingel, Eindhoven, Netherlands, assignor to U.S., Philips, Corporation, New York, N.Y.

Filed Apr. 17, 1968, Ser. No. 721,953
Claims priority, application Netherlands, May 13, 1967, 6706735
Int. Cl. B01j *17/00*; H01l *1/16*
U.S. Cl. 29—577 **9 Claims**



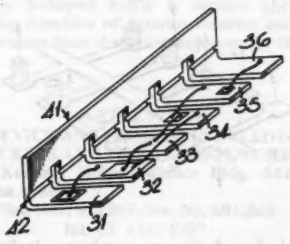
A method for making an integrated circuit with circuit elements dielectrically isolated is described. The method involves growing an epitaxial layer on a substrate, masking where desired the epitaxial layer surface against oxidation, and sinking a thermal oxide into the epitaxial layer. A support is then mounted on the epitaxial layer top and the substrate removed, for example, by electrolytic etching. Circuit elements are built into the dielectrically isolated semiconductor regions. The technique allows the provision of connections on both sides of the regions containing circuit elements.

3,602,983

A METHOD OF MANUFACTURING SEMICONDUCTOR CIRCUITS

Michael Murray Bertioli, Lichfield, and David Everitt Millington, Solihull, both of, England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Jan. 4, 1968, Ser. No. 695,794
Claims priority, application Great Britain, Jan. 19, 1967, 2893/67
Int. Cl. B01j *17/00*; H01l *1/16*, *1/24*, *7/68*
U.S. Cl. 29—577 **1 Claim**



A semiconductor circuit, for example a semiconductor voltage regulator, is manufactured by mounting the active

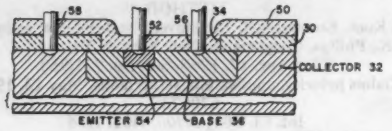
components of the circuit on separate platforms on a conductive strip. The strip is secured to a printed circuit board designed with conductive areas which receive the platforms of the strip to make electrical connections to the platforms, the board itself incorporating passive components of the circuit and the connecting leads between various components in the circuit. After the strip is placed on the board, portions of the strip between the platforms are removed so as to isolate the platforms, and then any connections remaining are made to complete the circuit.

3,602,984

METHOD OF MANUFACTURING SEMI-CONDUCTOR DEVICES USING REFRACTORY DIELECTRICS

Robert L. Trent, Marblehead, Mass., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 2, 1967, Ser. No. 672,388
Int. Cl. B01j *17/00;* **H01l** *5/00*
U.S. Cl. 29—578 **9 Claims**



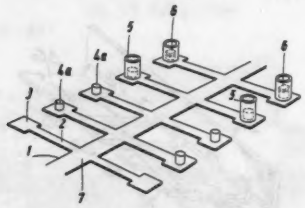
This disclosure is to a process for making semiconductor devices having refractory dielectrics as diffusant masks and interconnection insulations and the resulting structures. The refractory dielectric is deposited onto a semiconductor wafer and an aperture is created that extends through the dielectric to the wafer. An impurity is then diffused into the wafer at the aperture's location and a semiconductor junction is created. In this manner one embodiment of the disclosed structure is formed. If desired, further junctions can be created by applying a second deposition of the refractory dielectric and then performing further aperture creating and impurity diffusing operations. Alternatively, a thermally-grown dielectric can be grown in the first aperture and a second aperture can be created through the thermally-grown dielectric. A further impurity is then diffused into the wafer at the second aperture's location.

3,602,985

METHOD OF PRODUCING SEMICONDUCTOR DEVICES

Edwin Nosch, Heilbronn, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm, Danube, Germany

Filed Oct. 1, 1969, Ser. No. 862,775
Claims priority, application Germany, Oct. 1, 1968, P 18 00 192.8
Int. Cl. B01j *17/00;* **H01l** *1/10*
U.S. Cl. 29—588 **12 Claims**



A method of producing semiconductor devices comprising securing contacts onto tongues or rungs of contact-making strips, inverting housing members onto the contacts, placing a semiconductor body on each of the contacts and introducing second contacts on tongues or rungs of a contact-making strip into the housing members to connect them to the semiconductor bodies. The device is completed by heat treatment of the housing to attach it to the contacts and parting the tongues or rungs from their contact-making strip.

3,602,986

METHOD OF FABRICATING RADIALLY ORIENTED MAGNETS

Joel A. Conwicke, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 31, 1969, Ser. No. 873,062
Int. Cl. H01f *3/08*
U.S. Cl. 29—608 **8 Claims**

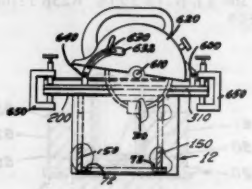
A method of fabricating radially oriented particle disc or arc magnets comprising forming a flexible sheet containing magnetic particles with their easy magnetic axes perpendicular to the sheet surface, winding the sheet, cutting to the desired configuration, laminating each cut portion, and sintering each laminated portion to form the finished permanent magnet. The fabricated anisotropic magnets produced by the process of this invention can be used in eddy current devices and permanent magnet DC motors.

3,602,987

SAWING JIG FOR OPENING PUBLIC TELEPHONE BOXES

Walter L. Miller, c/o Wally's Key & Lock Shop, 1814 Clark St., Manitowac, Wis.

Filed May 2, 1969, Ser. No. 821,390
Int. Cl. B26b *25/00;* **B27b** *5/02*
U.S. Cl. 30—273 **4 Claims**



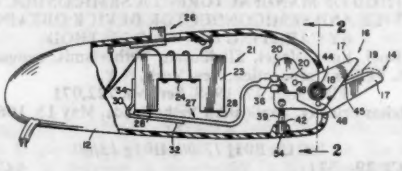
A saw-supporting jig for supporting a circular power saw in a position for cutting through the latch of the door of the coin compartment of a telephone box comprising means for connecting the jig by bolts extended into the bolt holes of the bolts that hold the upper part of the telephone box in place, the jig having a platform thereon for supporting the saw.

3,602,988

ELECTRIC SCISSORS BLADES

Robert E. Little, Columbus, Ind., assignor to Arvin Industries, Inc., Columbus, Ind.

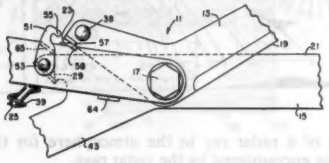
Filed Nov. 19, 1969, Ser. No. 878,099
Int. Cl. B26b *15/00*
U.S. Cl. 30—228 **6 Claims**



Electric scissors having blades spring biased toward one another with antifriction buttons therebetween and pivotally connected by a pin. A threaded fastener is received by and extends into the housing and a collar and engages a tapped member which is pivotably attached to a fixed blade whereby

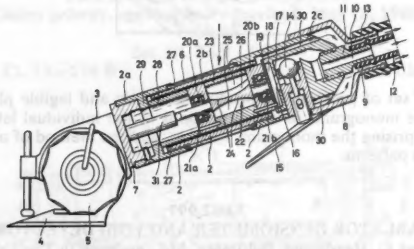
rotation of the fastener moves the fixed blade with respect to the movable blade to alter the location of the cutting area along the cutting edges of the blades.

3,602,989
STORED ENERGY SHEAR DEVICE
Marnie C. Averitt, 107 Westdale Court, Timonium, Md.
Filed Oct. 1, 1969, Ser. No. 862,802
Int. Cl. B26b *13/16*
U.S. Cl. 30—261 **12 Claims**



A portable shear device comprising pivotally mounted blades normally biased toward a closed or cutting position. Handle means is provided to move the blades relative to one another toward an open position and is releasable whereupon the blades close and perform a cut.

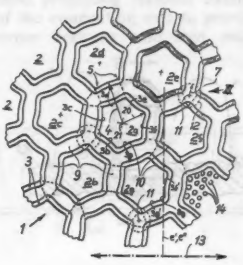
3,602,990
FABRIC-CUTTING MACHINE
Gunter Stumpf, 7421 Mehrstetten Kreis Munsingen, Germany
Filed Nov. 8, 1968, Ser. No. 774,433
Claims priority, application Germany, Nov. 24, 1967, P 16 60 122.2
Int. Cl. B26b *15/00*
U.S. Cl. 30—276 **2 Claims**



A pneumatically operated cutter in which the spent air is recovered and vented remotely of the machine.

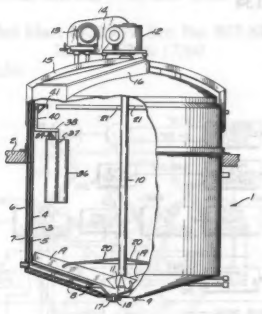
3,602,991
SHEARING FOIL FOR A DRY-SHAVING RAZOR
Hans Joachim Heinrich, deceased late of Braunschweig, Germany, and Edith Heinrich and Eckart Heinrich, legal heirs, assignors to Balco Filtertechnik GmbH, Braunschweig, Germany
Filed Nov. 18, 1968, Ser. No. 784,985
Claims priority, application Germany, Nov. 18, 1968, P 15 53 666.0
Int. Cl. B26b *19/04*
U.S. Cl. 30—346.51 **4 Claims**
This application filed under Rule 47

A shearing foil for a dry-shaving razor adapted to cooperate with a movable blade and provided with a multiplicity of hair-inlet openings. The openings are of generally polygonal configuration with inwardly convex arc-segmental edges adjoining one another at the vertices of the polygon. The radii of curvature of the arc segment edges exceed the radius of the opening while the centers of curvature are



located externally of the opening and preferably at the centers of the nearest-neighbor openings.

3,602,992
METHOD AND APPARATUS FOR MAKING CHEESE
Norman J. Peters, Fond Du Lac, Wis., assignor to DEC International Inc.
Filed Apr. 25, 1969, Ser. No. 819,148
Int. Cl. A01j *25/00*
U.S. Cl. 31—46 **8 Claims**



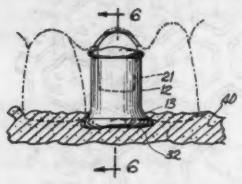
A cheese-making vat comprising a closed vessel having a central vertical shaft and agitator paddles are attached to the lower end of the shaft. During the cheese-making process, a portion of the whey is withdrawn from the upper end of the vat while the agitators are operating. To withdraw the whey, a tube is inserted into the upper end of the vat and the lower end of the tube carries a perforated cylindrical strainer which may be covered by a fabric filter bag. Whey is drawn through the strainer and into the tube.

A generally S-shaped baffle is located ahead of the cylinder in the direction of agitator rotation and serves to protect the strainer from direct impingement by the circulating whey.

3,602,993
DENTAL DEVICE AND PROCESS USING IT TO MAKE JACKETS AND FIXED BRIDGEWORK
Bernard D. Kenney, Midwest Office Bldg. 6415 Stumph Road, Parma, Ohio
Filed Nov. 9, 1967, Ser. No. 681,860
Int. Cl. A61c *9/00*
U.S. Cl. 32—17 **5 Claims**

A hollow dental device that is cylindrical or of other straight wall configuration, except adjacent at one end, is used with modeling compound to make a coping in the process of making jackets and fixed bridgework. The device

is contoured at that end to insure retention within the plaster impression made during the process. This dental device is relatively rigid and very resilient as compared with conventional copper bands.

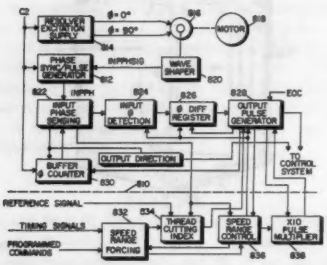


3,602,994

PULSE GENERATOR SYSTEM RESPONSIVE TO SPINDLE MOTOR ROTATIONAL PHASE SIGNAL FOR PROVIDING DIGITAL PULSES AT RATE DEPENDENT UPON MOTOR SPEED

John D. Layman, Waynesboro, Va., assignor to General Electric Company

Filed Mar. 12, 1970, Ser. No. 18,871
Int. Cl. H03b *3/04;* **H03d** *3/02;* **H03k** *9/06*
U.S. Cl. 328—134 **17 Claims**



Apparatus responsive to a spindle motor develops velocity pulses for application to a numerical control system. The velocity pulses are generated at a rate proportional to the rotational rate of the spindle motor. The motor rotational position is converted to an asynchronous waveform which is synchronized and phase compared to a reference waveform. The phase difference is stored in complement form by an up counter. A number of pulses dependent upon the up counter contents is metered out at a maximum rate controlled by a signal from the numerical control system. Scaling means controls the relation between phase difference and number of pulses generated.

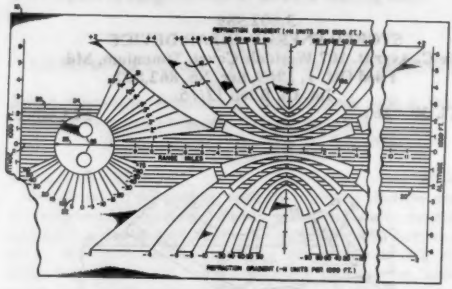
3,602,995

RADAR PROPAGATION RAY PLOTTER

Daniel Barron, 9326 Edmonston Road, Greenbelt, Md.

Filed Sept. 22, 1969, Ser. No. 859,656
Int. Cl. B43l *5/00*
U.S. Cl. 33—1 C **1 Claim**

This invention is directed to the structure and use of a template for plotting a family of radar rays in the atmosphere in order to determine the zones of high probability of detection of airborne targets such as missiles, satellites and other aircraft. The template has curved slots therein representative of the path of a radar ray in the atmosphere for the specific conditions encountered by the radar rays.

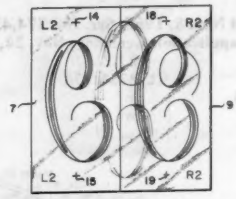


3,602,996

MASTER COPY OR PATTERNS FOR MACHINE FORMING OF MONOGRAMS AND METHOD OF USING SAME

Gerald L. Hill, 1047 West Onion St., Fullerton, Pa.

Filed May 29, 1969, Ser. No. 828,868
Int. Cl. B43l *13/10*
U.S. Cl. 33—23 K **4 Claims**



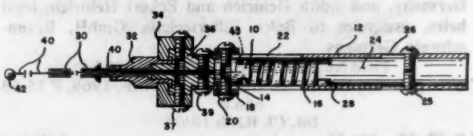
A set of patterns for producing artistic and legible plural letter monograms in which portions of the individual letters comprising the monograms overlap, and the method of using such patterns.

3,602,997

ABLATOR DENSIOMETER AND VOID DETECTOR

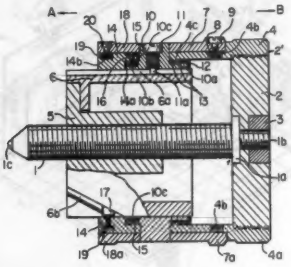
Albert G. Henderson, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Mar. 10, 1969, Ser. No. 805,552
Int. Cl. G01b *5/18*
U.S. Cl. 33—169 B **1 Claim**



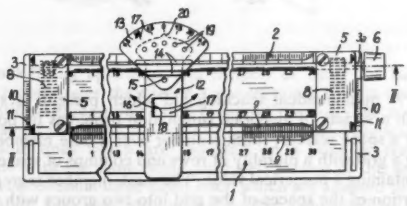
A spring-tensioned plunger movable across a surface such as a cellular "honeycomb" panel, for detecting voids, weak areas, porous areas; and means for measuring the depth of the weakened area in terms of plunger penetration.

3,602,998
MICROMETER HEAD
Keikichi Imai, and Sakuzo Matsumoto, both of Tokyo, Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan
Filed Dec. 3, 1968, Ser. No. 780,688
Int. Cl. G01b 3/18
U.S. Cl. 33—170 4 Claims



A micrometer head capable of adjusting the starting zero point of the graduations for a measurement. A graduated ring is manually rotatable relative to a thimble for the zero adjustment of the graduations at any axial position of the spindle. An indicating ring is rotatably mounted in the micrometer head and bears thereon graduations. The indicating ring is so coupled operatively with the spindle by guide means that the indicating ring is rotatably moved by one pitch of the graduations thereon as the spindle is rotated by one revolution. The indicating ring is further manually rotatable relative to the micrometer head regardless of the axial position of the spindle so that the zero adjustment of the graduations on the indicating ring is effected at any axial position of the spindle while the indicating ring is rotatably moved in conjunction with the rotation of the spindle during the normal measuring operation of the micrometer head.

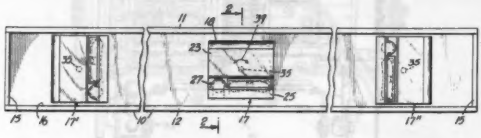
3,602,999
WRITING AID
Rudolf Villiger, Mulinenstrasse 30, Bern, Switzerland
Filed May 9, 1969, Ser. No. 823,356
Claims priority, application Switzerland, May 15, 1968, 7500/68
Int. Cl. B43l 13/02
U.S. Cl. 33—174 B 3 Claims



There is disclosed an improved writing aid which embodies two substantially parallel rulers selectively adjustably fixed at a spacing from one another and which delimit therebetween a writing field for drawing with a uniform height characters, such as letters and numbers.

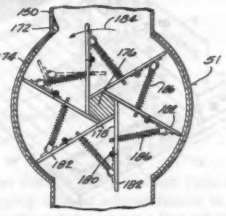
3,603,000
SPIRIT LEVEL FRAME FOR MOUNTING SPIRIT VIAL UNITS
Seymour A. Ostrager, Bronx, N.Y., assignor to Miracle Instrument Co., New York, N.Y.
Continuation of application Ser. No. 670,944, Sept. 27, 1967. This application Dec. 10, 1969, Ser. No. 883,893
Int. Cl. G01c 9/24
U.S. Cl. 33—211 12 Claims

A spirit level frame having means for mounting therein a plurality of spirit vial units is provided in the form of an elongated frame of channelled construction having parallel sidewalls, a perpendicularly disposed connecting web between the parallel sidewalls so that the sidewalls project a substantial distance from one surface of the connecting web, and a thin walled projecting member extending from the outer surface of the connecting web to provide at least one right angle corner between said thin walled projecting



member and said surface of the web. The projecting member, the outer surface of the connecting web and the parallel sidewalls provide versatile bearing surfaces for selectively engaging horizontal and vertical bodies in gauging the level and/or plumb thereof. The channelled construction of the spirit level frame permits spirit vial units to be adjustably and protectively arranged therein at longitudinally spaced intervals, including spirit vial units which permit simultaneous reading in two directions.

3,603,001
AGRICULTURAL DEHYDRATING AND COOLING SYSTEM
Gerald D. Arnold, Ettrick, Wis., and John B. Arnold, Memphis, Tenn.
Filed Mar. 17, 1969, Ser. No. 807,802
Int. Cl. F26b 17/00
U.S. Cl. 34—136 1 Claim

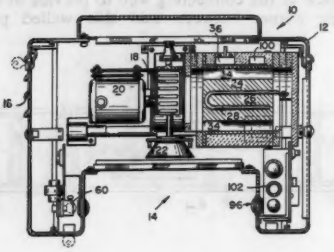


A furnace for providing dehydrating gases has its flue connected in series with a multiple-pass dehydrating drum compartment by longitudinal radial partitions to promote efficient intimate exposure of material to dehydrated gas by subdividing both the gas and the material into narrow streams while still providing the tumbling which results from drum rotation. The light output of the drum is delivered through a settling chamber into a cyclone separator which has its gas discharge port connected to a blower that subjects the chamber and drum and furnace to vacuum. The light solids are then recombined with heavy solids before discharge. Discharge of solids without access of air is controlled by a rotary valve which has generally radial vanes protected from breakage by provision of angularly yieldable end portions.

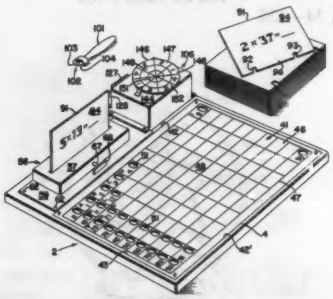
3,603,002
DRYING APPARATUS
Theodore L. Spierer, Brooklyn, N.Y., assignor to Spier Electronics Inc., Brooklyn, N.Y.
Filed July 8, 1969, Ser. No. 839,860
Int. Cl. F24h 3/04; F26b 19/00
U.S. Cl. 34—243 R 3 Claims

The invention relates to a thermal-responsive device for a forced air hand dryer which permits the control of the hot air

emanating from the drying apparatus and the velocity of the forced air impinging upon the object to be dried.



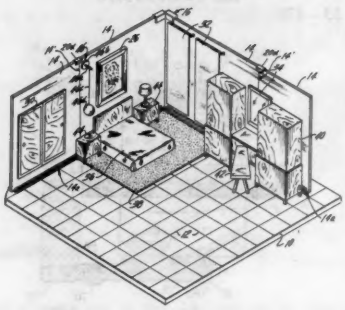
3,603,003
EDUCATIONAL GAME BOARD ASSEMBLY
Frank L. Ziegler, P.O. Box 235, Eureka, Calif.
Filed Mar. 30, 1970, Ser. No. 23,857
Int. Cl. G09b *7/02*
U.S. Cl. 35—9 R **17 Claims**



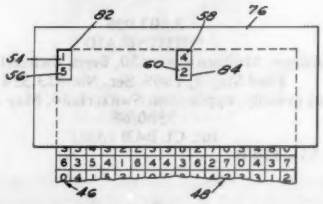
Presented is a game board assembly for teaching or amusement purposes, including electrical contact means conditioned by the insertion of a coded card bearing a question, the card being coded in correlation to the correct answer to the question, and a multiplicity of cross points one of which is correlated to the correct answer to the question and is adapted to be selected by the contestant or student so as to signify selection of the correct answer to the question.

3,603,004
ARCHITECTURAL INTERIOR-SIMULATING ARRANGEMENT
Sidney Fink, 2711 E. 28th Street, Brooklyn, N.Y.
Filed Nov. 29, 1968, Ser. No. 779,789
Int. Cl. G09b *25/04*
U.S. Cl. 35—16 **8 Claims**

An arrangement for simulating the layout of architectural interiors to a predetermined scale. Wall panels may be arranged in any desired configuration upon a floor base having scales marked upon its surface from which the dimension and area of a room or similar space may be readily obtained. Doors, windows and wall decorations may be freely located on the wall panels through magnetic attraction effects. Interior furnishings are designed to scale, and have an appearance simulating the actual furniture to be placed within the full scale interiors.



3,603,005
MATHEMATICAL TEACHING AID
Willis N. Dysart, 4532 Whittier Blvd., Los Angeles, Calif.
Filed Sept. 3, 1969, Ser. No. 854,818
Int. Cl. G09b *19/02;* **G06c** *3/00*
U.S. Cl. 35—30 **13 Claims**

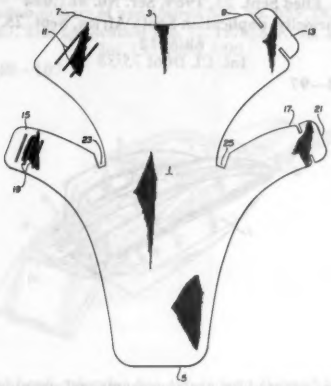


A mathematical teaching aid which presents a student with a variety of algebraic summation problems by positioning a space selector mask member over a base member having a grid with a plurality of rows and columns of spaces each containing a numerical value. The mask member segregates a portion of the spaces of the grid into two groups with the algebraic sum of the numerals of the spaces in one group being equal to the algebraic sum of the numerals of the spaces in the other group.

3,603,006
FOOTWEAR ARTICLE
Dallas N. Davenport; Seabrook, N. H. and Sidney Z. Smith, all of Worcester, Mass., assignors to The General Tire & Rubber Company
Filed July 10, 1970, Ser. No. 53,759
Int. Cl. A43b *3/12*
U.S. Cl. 36—11.5 **7 Claims**

The conventional step-in or slide-on slipper tends to loosen and slide off the front of the foot during normal walking motion. Binding or otherwise tightly clasping the slipper to the foot defeats the general purpose of the slipper as an easily attired article of footwear. This invention is an article adapted

to be rapidly assembled into a slipper of the step-in or slide-on type that remains comfortably loose during wearing and is

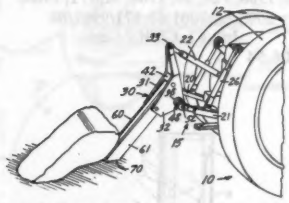


adapted to remain secured to the foot during walking or other foot movement.

3,603,007
ROCK LIFTER

Edwin Naber, and Paul Naber, both of Rte. 1, Lake Lillian, Minn.

Filed June 16, 1969, Ser. No. 833,520
Int. Cl. A01b *43/00;* **A01d** *33/04*
U.S. Cl. 37—2 **6 Claims**



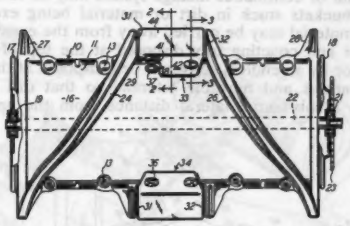
A rock-lifting apparatus and method of using the same which incorporates the use of a conventional tractor and a conventional three point hitch mounted thereon. The rock-lifting apparatus includes a pair of spaced parallel elongated removable tines which are mounted on a yoke or frame structure with the same being journaled on two of the arms of the conventional three-point hitch which are adapted to be articulated. The yoke structure is further connected to the third arm of the hitch for positioning the tines and the yoke on its mounting relative to the ground. The rock-lifting apparatus and method includes the use of tractor movement to position the tines under the embedded stone to be lifted and operation of the articulated arms of the hitch to perform the lifting function.

3,603,008
SNOW THROWER AUGER WITH REPLACEABLE PADDLE

Sherman C. Heth, Racine, Wis., assignor to Jacobsen Manufacturing Company, Racine, Wis.

Filed Sept. 10, 1969, Ser. No. 856,693
Int. Cl. E01h *5/00*
U.S. Cl. 37—43 E **11 Claims**

A snow thrower auger having a cylindrical base portion and having auger flights extending radially outwardly from the base portion. A paddle is replaceably secured to the auger, and it functions with the flights to throw the snow away from the auger. The paddle is a piece separate from the

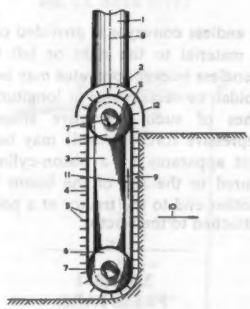


remainder of the auger and can be replaced if the paddle is damaged.

3,603,009
SUCTION DREDGE HAVING ENDLESS DIGGER ALIGNED WITH SUCTION PIPE

Pieter Theodor Velzeboer, Monster, Netherlands, assignor to N. V. Industrieele Handelscombinate, Holland, Rotterdam, Netherlands

Filed Mar. 13, 1969, Ser. No. 806,987
Int. Cl. E02f *3/92, 3/14*
U.S. Cl. 37—60 **7 Claims**



A digging suction dredge has a suction tube and an endless conveyor-type digging device whose frame is rigid with the intake end of the suction tube along a line which is parallel to the centerline of the intake end of the suction tube. The endless member has digging paddles thereon that fan out about end rollers to discharge material to the suction tube.

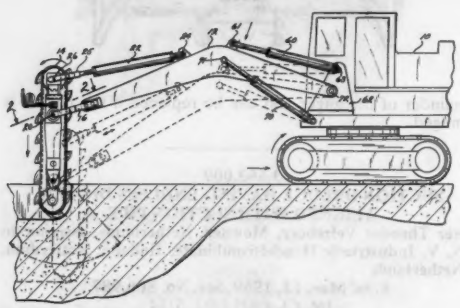
3,603,010
BACKHOE EXCAVATOR WITH ENDLESS BUCKET ATTACHMENT

Charles J. Polinek, 5605 Chilton Lane, Erie, Pa.

Filed May 15, 1969, Ser. No. 824,843
Int. Cl. E02f *5/06*
U.S. Cl. 37—83 **14 Claims**

A backhoe machine including a track laying or rubber tire tractor having a vertically adjustable boom (with the usual stick and bucket being removed) and having an endless bucket apparatus detachably secured intermediate its ends to the outer end of the boom. Longitudinal pitch is provided for the endless bucket apparatus by a piston-cylinder mechanism secured at one end to the top of the boom intermediate its ends and at its other end to a point near the top of the apparatus. Lateral pitch is provided by a reversible hydraulic rotator or hydraulic motor disposed between and connecting the end of the boom and the apparatus. The frame of the endless bucket apparatus may be formed of detachable sections to permit forming the apparatus into preselected lengths. An endless bucket gear chain or continuous linkage system on the apparatus may be driven by a reversible

hydraulic gear chain motor through a set of meshed gears all preferably positioned at the bottom of the apparatus to provide more positive drive to the digging buckets. The endless gear chain or continuous linkage system may be reversed to release buckets stuck in dirt or material being excavated. Dirt or material may be carried away from the excavator by an auger and coacting tray disposed at the top of the apparatus or by an endless conveyor belt disposed at the top of the apparatus and movable laterally so that dirt may be dumped a substantial lateral distance from the apparatus.



The auger or endless conveyor is provided on the apparatus for dumping material to the right or left side of the apparatus. The endless bucket apparatus may be circular, triangular, trapezoidal, or rectangular in longitudinal section for digging ditches of such respective shapes. A positive downward depressive force (crowd) may be applied to the endless bucket apparatus by a piston-cylinder mechanism rotatably secured to the top of the boom intermediate its ends, and its other end to the tractor at a point above where the boom is attached to the tractor.

3,603,011

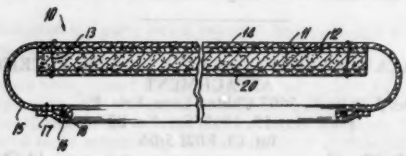
PRESS PADS

Jerome Herbert Cohen, Bayside, N.Y., assignor to Burtest Products Corporation, New York, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,260

Int. Cl. D06f *71/36*

U.S. Cl. 38—66 **15 Claims**



The press pad comprises a layer of felted high heat resistant fibrous material impregnated with high heat resistant resilient material. Stitched to one side of said layer is a sheet of loosely woven high heat resistant cloth impregnated with high heat resistant material. A cover cloth of closely woven high heat resistant material impregnated with high heat resistant material may be stitched to said woven sheet in covering relation thereto. The press pad may be attached to the buck or head of a pressing machine or to the underside of a hand pressing iron or to a laundry machine.

3,603,012

FLAT IRONS

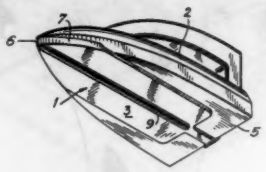
Belinda Haynes, 967 Culross Road, Bryanston, Johannesburg, Republic of South Africa

Filed Sept. 25, 1969, Ser. No. 861,084

Claims priority, application South Africa, Sept. 25, 1968, 68/6212

Int. Cl. D06f *75/38*

U.S. Cl. 38—97 **6 Claims**



Flat irons adapted for pressing seams and seam-pressing attachments for conventional flat irons in which there is embodied in the underside of the flat iron or attachment a longitudinally extending guide rib arranged to part the free edges of material on each side of a seam and press the material in the immediate vicinity of the seam.

3,603,013

ELECTRIC ILLUMINATION DEVICES

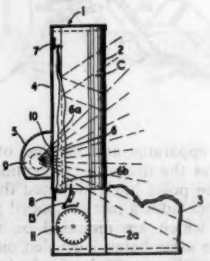
Frederick Brydone Reed, and Ernest Eugene Gardiner, both of Walsall, England, assignors to Radiation Sunhouse Limited, Walsall, England

Filed Jan. 31, 1969, Ser. No. 795,565

Claims priority, application Great Britain, Feb. 6, 1968, Feb. 13, 1968, Feb. 20, 1968, Mar. 1, 1968, 5775/68;7001/68;171/9981/68

Int. Cl. G09f *13/34*

U.S. Cl. 40—106.54 **9 Claims**



An electric illumination device which includes a translucent viewing screen, imitation fuel means, suspended flexible material disposed inwards of the viewing screen, a light source disposed inwards of the flexible material, and means for causing airflow for moving the flexible material to vary the lighting effect imparted by the device, said flexible material having upper portions which when the device is in operation are caused by the airflow to move in relation to light from the light source to cause a random flickering effect visible as a flame effect through the viewing screen, and said flexible material having lower portions which when the device is in operation are caused by the airflow to move in relation to light from the light source to cause a random flickering effect illuminating from within the device the imitation fuel means.

3,603,014

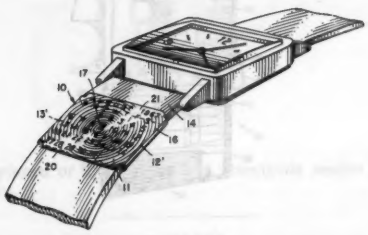
PROCESS OF HIGHLIGHTING THE INDICIA ON A WATCHBAND CALENDAR

Walter A. Schomburg, Park Ridge, Ill., assignor to Chicago Etching Corporation, Chicago, Ill.

Continuation-in-part of application Ser. No. 659,782, July 31, 1967. This application Jan. 12, 1970, Ser. No. 2,453

Int. Cl. G09d 3/00

U.S. Cl. 40—107 2 Claims



A watchband calendar has the indicia thereof highlighted by spin-finishing the viewing surface to create sector patterns of reflected light by orienting the viewing surface to reflect light.

3,603,015

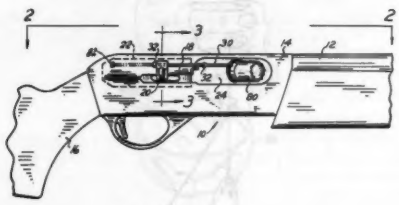
EJECTED SHELL RETAINER

Kenneth W. Jensen, 9309 Louis, Detroit, Mich.

Filed Apr. 4, 1969, Ser. No. 813,585

Int. Cl. F41c 27/00

U.S. Cl. 42—1 R 10 Claims



An ejected shell retainer for a multiple shot semiautomatic gun which consists of a keeper rod slidably supported on the gun substantially parallel to the barrel, and disposed adjacent the discharge port. In an operative position, the keeper rod holds the empty shell in the gun receiver where it can be manually removed after a single firing. In a nonoperative position, the keeper rod allows the ejected shells to leave the discharge port so that the magazine can be fully loaded to permit multiple firing of the gun.

3,603,016

NET DRUM SYSTEM

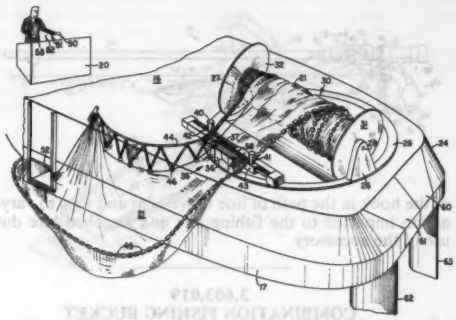
Hubert J. Ursich, 2820 Ivy St., San Diego, Calif., and David J. Seymour, San Francisco, Calif.

Filed Oct. 17, 1969, Ser. No. 867,190

Int. Cl. A01k 73/12

U.S. Cl. 43—8 2 Claims

A net-laying and stowing system for oceangoing vessels having a hull with a deck and a stern having a smooth surface over which the net may enter into the water. A turntable on the deck near the stern enables motion of 180° from the stern toward the portside toward the bow and back again, and it carries a stowing and laying drum around which the net is wound, between a pair of end flanges. On the turntable is a pair of guides for individually engaging each edge of the net; the guides are movable across approximately half the net from each of the two edges, for spooling the net onto the drum, so that the weights, floats, and so on, are able to be



located in such a way that the net is spooled around the drum in a cylinder rather than bulging at each end.

3,603,017

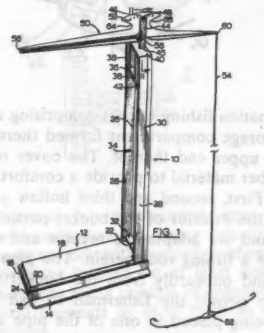
ICE FISHING APPARATUS

Karl G. T. Happe, 38 Tara Avenue, Scarborough, Ontario, Canada

Filed Oct. 13, 1969, Ser. No. 865,663

Int. Cl. A01k 97/12

U.S. Cl. 43—17 11 Claims



An ice fishing apparatus including means to move a pivot support relative to a base. The apparatus includes first and second line supports each consisting of spaced-apart holders to hold a plurality of elongated loops of fishing line, the linear distance between the two holders of one support being greater than the linear distance between the two holders of the other support. An assemblable and disassemblable ice fishing apparatus also is described consisting of a plurality of cooperating members.

3,603,018

FISHING ROD ACCESSORY

Elmer W. Mercer, 1212 San Luis Drive, Orlando, Fla.

Filed Oct. 20, 1969, Ser. No. 867,518

Int. Cl. A01k 87/00

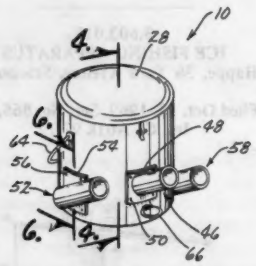
U.S. Cl. 43—19.2 8 Claims

A spring-loaded device used in imparting simulated live bait movement to a fishing lure has a finger mounted for movement between an inoperative and an operative position. At the operative position, a hook end portion of the finger is located in the path of the fishline movement between the reel end eyelet of the fishing rod and the face of an attached open face spinning reel to momentarily catch and release the line during each revolution of the reel flier as the line is reeled in.

A clamp used in detachably mounting the device on the fishing rod in one embodiment is adjustable to vary the location

of the hook in the path of line movement and thus to vary the action imparted to the fishing line and attached lure during use of the accessory.

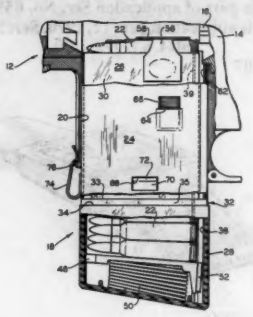
3,603,019
COMBINATION FISHING BUCKET
John F. Smeltzer, Meriden, Iowa
Filed Dec. 31, 1969, Ser. No. 889,484
Int. Cl. A01k *97/10*
U.S. Cl. 43—21.2 **9 Claims**



A combination fishing bucket comprising a bucket portion having a storage compartment formed therein with a cover closing the upper end thereof. The cover is padded with a sponge rubber material to provide a comfortable seat for the fisherman. First, second and third hollow pipe sections are secured to the exterior of the bucket portion approximately 90° apart and are adapted to receive and support either a flashlight or a fishing rod therein. The pipe sections extend upwardly and outwardly from the bucket portion and are designed to permit the fisherman to fish at night with a flashlight being placed in one of the pipe sections so as to direct light on the upper end of the fishing rod in the pipe section adjacent thereto. The first and third pipe sections are spaced approximately 180° apart with respect to the bucket portion to permit the fisherman to selectively use either of the same depending upon the direction of stream flow.

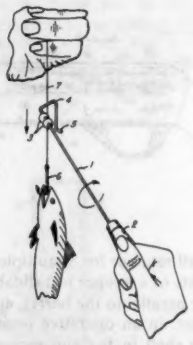
3,603,020
MAGAZINE ASSEMBLY WITH EXPENDABLE CARTRIDGE CONTAINER UNIT
Harold H. Wiese, Davenport, Iowa, assignor to the United States of America as represented by the Secretary of the Army
Filed Mar. 27, 1970, Ser. No. 23,142
Int. Cl. F41c *25/02;* **F42b** *39/00*
U.S. Cl. 42—50 **7 Claims**

A replacement cartridge magazine for a firearm comprises an adapter unit having a configuration similar to that of the upper portion of the standard magazine therefor, and a cartridge container with a spring-biased follower, which holds the cartridge requirements of the magazine assembly. The adapter preferably fabricated from metal, is releasably latched to the firearm so as to be normally a part thereof and the container, inexpensively manufactured from plastic so as to be expendable, is releasably latched to the adapter. A tape extends over the top of the container to secure the cartridges therein when loaded and so as to be sheared by the firearm bolt during passage over the magazine assembly. A protective



cover is also provided for installation over the top, open portion of the container and is sealed by adhesive tape thereto.

3,603,021
FISH HOOK DISENGAGING TOOL
John F. Nunley, 5425 S. Rice Ave., Houston, Tex.
Filed May 21, 1969, Ser. No. 826,595
Int. Cl. A01k *97/00*
U.S. Cl. 43—53.5 **2 Claims**

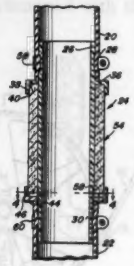


A disengaging tool having means for guiding the tool into position on a fish hook shank, and having means for rotating action against the hooked fish to disengage the fish hook from the flesh of the fish upon rotation of the tool, without contacting the fish with the hands of the user.

3,603,022
INSECT AND RODENT BAND
Robert G. Asher, and Frances E. Asher, both of 429 Elwood St., P.O. Box 168, Sterling, Colo.
Filed July 14, 1969, Ser. No. 841,481
Int. Cl. A01m *1/20*
U.S. Cl. 43—131 **10 Claims**

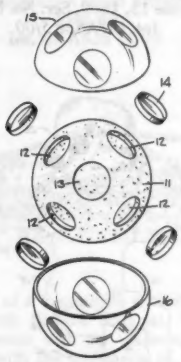
A band of absorbent material for holding insecticide and/or rodent repellent is disposed about a tubular section interposed in an associated sewer line and the tubular section includes structure on its opposite ends defining outstanding circumferential channels opening toward each other within which the axial ends of the band are seated. One of the structures defining a circumferential channel is axially removable

from the associated end of the tubular member whereby the band may also be axially removed from the tubular member



and replaced or again soaked in insecticide and/or rodent repellent.

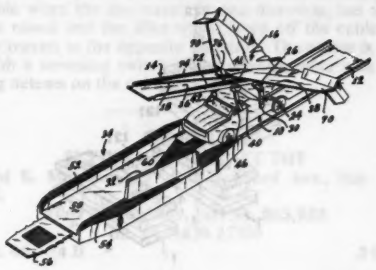
3,603,023
TOY BALL
Timothy J. McHugh, 4 Hilltop Road, Bronxville, N.Y.
Filed Feb. 25, 1970, Ser. No. 13,972
Int. Cl. A63h *33/00*
U.S. Cl. 46—1 R **8 Claims**



A toy ball having a hollow spherical member which is enclosed by two attached hemispherical members. A plurality of pockets are located on the surface of the spherical member and cups are press-fitted into each of these pockets. A movable attention getting object is placed in each cup and the two hemispheres are sealed together over the spherical member to seal the object in each cup. When the toy ball is rolled along a surface or otherwise rotated the objects in each cut move providing an item of interest and attractiveness to children of tender ages.

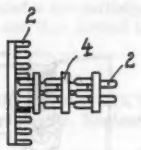
3,603,024
LAUNCHER FOR TOY AIRCRAFT
Homer S. Davis, Los Angeles, and Derek J. Gay, Redondo Beach, both of, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Nov. 26, 1969, Ser. No. 880,314
Int. Cl. A63h *27/14*
U.S. Cl. 46—01 R **11 Claims**

Apparatus for launching a toy aircraft comprising a launching ramp mounted on a toy automobile vehicle, the ramp having a rubberband for projecting the aircraft in a forward direction. A toy airplane is installed by hooking a projection of the plane onto the rubberband, pulling the plane to the rear of the ramp, and inserting the projection into a hole in the ramp. A releasing lever pivotally mounted on the ramp can push the bracket out of the hole to launch the plane. A lever-engaging member located along the vehicle track,



pivots the lever as the vehicle moves by, so that the aircraft is released from a moving vehicle to obtain added speed.

3,603,025
ELEMENTS WITH PLURAL SURFACES HAVING UNIFORMLY SPACED INTERFITTABLE PROJECTIONS
Walter Heubl, Muncher Str. 41, 8852 Rain am Lech, Germany
Filed Sept. 30, 1968, Ser. No. 764,376
Claims priority, application Germany, Dec. 1, 1967, P 16 25 370.6
Int. Cl. A63h *33/06*
U.S. Cl. 46—25 **7 Claims**



Structural elements for construction toys, particularly made of synthetic resin material, these structural elements consisting of a core or body with mutually orthogonal rows of connecting projections located on at least one outer side thereof, the projections being capable of engaging with those of other structural elements so as to form an interlocking, frictional connection.

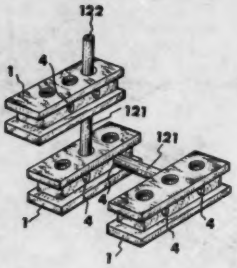
Many types of such of structural are known. These structural elements usually have a basic shape which enables them to be assembled together to form larger structures; for example the basic shape of these structural elements may be that of a cube, a square, a segment or a circle or the like, some of the outer surfaces of the structural elements having suitable connecting means enabling a number of structural elements to be combined together, usually by snap engagement.

In one of these prior art elements humplike protuberances and recesses located therebetween are so provided that they cooperate with portions of complementary shape of the other structural element so as to allow two structural elements to be connected together by snap engagement.

3,603,026
FABRICATING TOYS
Takaya Kishigami, Tokyo, Japan, assignor to Gakken Co., Ltd., Tokyo, Japan
Filed Mar. 18, 1970, Ser. No. 20,526
Int. Cl. A63h *33/10*
U.S. Cl. 46—26 **10 Claims**

A fabricating component has several first holes, and a second hole orthogonal to and between the first holes. One end of the first hole has an enlarged indentation, and the other end of the hole has a projection shaped like the indentation so that the projections of one component can be

interlocked with the indentations of another component. Several fabricating components can be connected by components which have the shape of a rod, a tube, a U-shaped member, or an elongated grooved member having a series of projections.



3,603,027

TOY

Kenneth Hing Cheung Fung, Hong Kong, assignor to A. Dransfield & Co., Ltd., Hong Kong

Filed May 8, 1969, Ser. No. 822,914

Claims priority, application Great Britain, Jan. 21, 1969, 3376/68

Int. Cl. A63h *29/16*

U.S. Cl. 46—44 **4 Claims**

A toy having a base, a support extending from the base and a body member rotatably mounted on the base. There are magnetic mean on the support and body member which cooperate to maintain the body member vertical. Furthermore, there are means on the support for blowing a jet of air at the body member to rotate same.

3,603,028

TOY NOISE MAKER

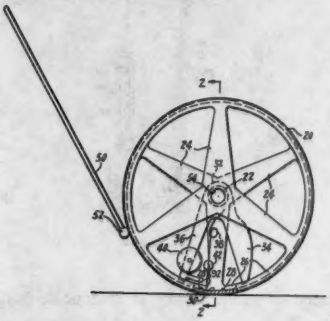
Alvin Roger Thorstad, Rte. #3, Granite Falls, Minn.

Filed May 5, 1970, Ser. No. 34,740

Int. Cl. A63h *5/00*

U.S. Cl. 46—114 **8 Claims**

A spoked wheel having cogs extending from the inside of the rim and having a pendulum pivotally mounted upon the hub of the wheel with a thin rod or spring connected thereto and extending toward the rim for striking the cogs as the wheel rolls, a bell on one of the sides of the pendulum against which the spring strikes after making contact with one of the cogs, and a handle for rolling the wheel.



3,603,029

KISS-THROWING DOLL

William B. Nutting, New York, N.Y., assignor to Horsman Dolls Inc., Columbia, S.C.

Filed June 13, 1969, Ser. No. 832,986

Int. Cl. A63h *5/00*

U.S. Cl. 46—117 **12 Claims**

A doll is provided with a bent arm pivotally mounted so as to bring the bent arm in the vicinity of a doll's mouth upon rotation of the arm in response to the pulling of a drawstring. When the doll's hand is in the vicinity of the doll's mouth, a spring, which is cocked during the pivoting movement of the arm, is released substantially simultaneously with the actuation of a sounding device which produces a simulated kissing sound. The mechanism is such that the movement of the arm under the influence of the spring will be comparatively rapid with respect to the movement of the arm to the proximity of the doll's mouth. The rapid movement of the arm accompanied by the simulated kissing sound simulates the throwing of a kiss by the doll.

3,603,030

JUMPING TOY

Philip D. Bart, Monsey, and Peter J. Waznys, Richmond Hill, both of, N.Y., assignors to Remco Industries, Inc., Harrison, N.J.

Filed Aug. 29, 1969, Ser. No. 854,185

Int. Cl. A63h *11/00*

U.S. Cl. 46—120 **12 Claims**

An animated doll is provided which is capable of jumping rope. This is accomplished by having a doll's body slide up

and down on the upper projections of its legs and, when the body is at the uppermost position, having the legs snap upwardly quickly. The arms carrying the rope swing around a 360° arc which is synchronized with the movement of the

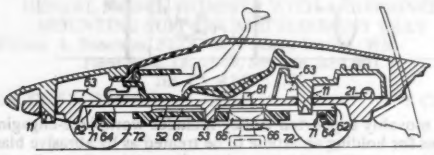
legs so that the rope passes beneath the feet just as the legs snap upwardly and before the doll drops down again upon its feet. Improved action is obtained if the rope is stretchable and is hooked under the doll's toes and stretched before the doll jumps.

3,603,031

TOY OR MODEL VEHICLES

Howard W. Fairbairn, Dallington, England, assignor to The Mettoy Company Limited

Filed Jan. 19, 1970, Ser. No. 4,150
Claims priority, application Great Britain, Jan. 21, 1969, 3396/69
Int. Cl. A63h *17/26*
U.S. Cl. 46—223 **2 Claims**



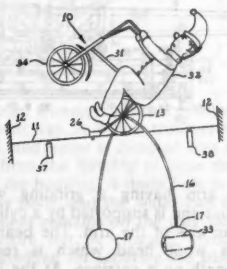
The running gear of a toy vehicle is carried by a frame, or subbase, of resiliently flexible material. The frame makes snap-fitting engagement with the underside of the vehicle, and is detachable with the assistance of a special purpose key, to facilitate removal of the running gear for repairs or replacement.

3,603,032

AERIAL BALANCING TOY

Harold Gladstone Heron, 4330 Sherbrooke Street West, Apt. 10, Montreal, Quebec, Canada

Filed May 25, 1970, Ser. No. 40,005
Int. Cl. A63h *17/20*
U.S. Cl. 46—244 R **7 Claims**



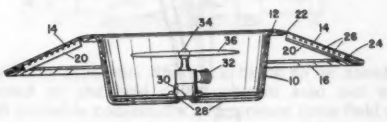
A toy body having a driving wheel and an idler wheel in tandem travels reversibly on an aerial cable. A weighted balancing yoke is suspended from the driving wheel axle and a reversible electric motor on the body is connected to the driving wheel. The body is rockable within limits on the driving wheel axle by reactive torque so that both wheels engage the cable when the toy travels in one direction, but the toy body is raised and the idler wheel lifted off the cable when the toy travels in the opposite direction. The motor is in circuit with a reversing switch which is engageable with travel limiting detents on the cable.

3,603,033

FLYING ROTORCRAFT TOY

Leonard E. Mueller, 4557 Mt. Hubbard Ave., San Diego, Calif.

Filed Oct. 6, 1969, Ser. No. 863,953
Int. Cl. A63h *27/00*
U.S. Cl. 46—74 D **3 Claims**



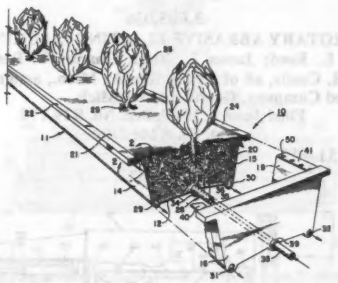
A flying toy having a driven propeller mounted in a duct, with lifting rotor blades extending from the top of the duct, the outer ends of the blades being interconnected by a protective annular ring. The duct and blade assembly rotates in the opposite direction to the propeller, due to torque, the lift of the blades adding to that of the propeller for vertical propulsion. When power is shut off, the toy descends gently in autorotation. The airframe structure is a simple unitary molding and the rotor blades are partially adjustable in pitch to vary the effective lift and thus control the flight.

3,603,034

PLANT-GROWTH STRUCTURE

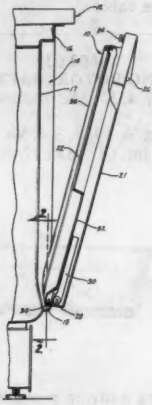
John P. Maxwell-Stewart, Battle, England, assignor to Jegco Inc., Oakland, Calif.

Filed June 16, 1969, Ser. No. 833,577
Int. Cl. A01g *9/02*
U.S. Cl. 47—38 **5 Claims**



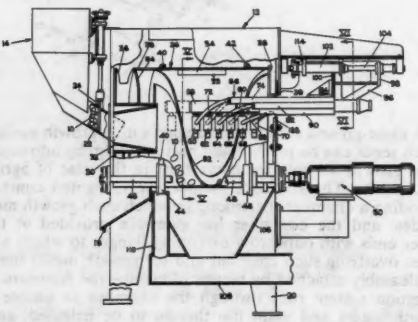
A plant-growth structure equipped with a growth media in which seeds can be planted and nurtured thereby into mature plant growth suitable for harvesting, in the case of agricultural plants. The structure includes an elongated container providing a chamber therealong in which such growth media resides, and the container has sidewalls provided at their upper ends with outwardly extending flanges to which a top cover overlying such chamber and the growth media therein is releasably attached by means of clamp-type fasteners. An irrigation system runs through the chamber to enable the growth media and plant life therein to be irrigated, and a drainage system associated with the container permits any excess liquids resulting from irrigation to drain from the growth media and chamber.

3,603,035
DISHWASHER DOOR SEAL
Henry J. Kaldenberg, Des Moines, Iowa, assignor to The Maytag Company, Newton, Iowa
Filed May 1, 1969, Ser. No. 820,830
Int. Cl. E06b 7/22
U.S. Cl. 49—485 12 Claims



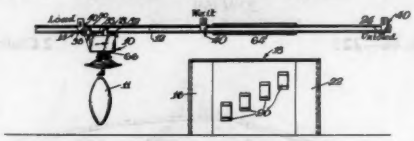
An improved seal structure is provided for automatic dishwashers having an access opening in the front for the insertion or removal of dishes. The dishwasher has a generally forwardly facing vertical seal abutment adjacent to the top and sides of the opening and a generally upwardly facing horizontal seal abutment adjacent to the bottom of the opening. The door is hinged at the bottom, and has an inner panel, which carries an elastomeric sealing strip. The sealing strip runs along the face of the inner panel juxtaposed to the perimeter of the inner panel at the top and sides and then along the bottom flange of the inner panel to form a seal with corresponding seal abutments when the door is closed. The elastomeric strip is continuous at the bottom corners of the inner panel and is twisted about 90° at these corners to form a smooth sealing transition between the face and bottom of the inner panel.

3,603,036
ROTARY ABRASIVE BLASTING MACHINE
Wallace L. Reed; James L. Reed; Charles T. Redden, and Carl H. Castle, all of Grand Rapids, Mich., assignors to W. L. Reed Company, Grand Rapids, Mich.
Filed June 2, 1969, Ser. No. 829,192
Int. Cl. B24c 3/04
U.S. Cl. 51—13 6 Claims



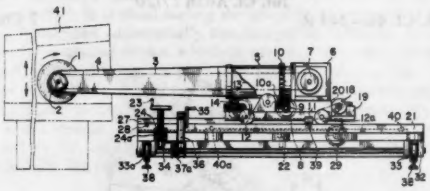
This disclosure relates to abrading small articles to remove molding or casting flash and to improve the surface for painting, plating and the like. The abrading machine has a drum formed of open mesh material and mounted for rotation about its longitudinal axis. Means are disclosed for feeding the small articles to an abrading area within the drum and for removing the abraded articles from the abrading area. An abrasive medium supply means is provided within the drum and mounted for reciprocatory motion within the abrading area to evenly abrade the articles continuously moved throughout the abrading area by the rotary motion of the drum. The abrasive medium supply means is also mounted for rotational movement about an axis parallel with the rotational axis of the drum. A helical rib is formed in the drum for feeding the articles to the abrading area during the abrading process. The helical rib is also employed to feed the articles to a discharge opening at one end of the abrading drum after the abrading process.

3,603,037
WORKPIECE-TREATING SYSTEM
Freeman M. Mann, Jr., and James H. Carpenter, Jr., both of Hagerstown, Md., assignors to The Carborundum Company, Niagara Falls, N.Y.
Division of Ser. No. 543,616, Apr. 19, 1966, Patent No. 3,495,720. Filed Apr. 1, 1969, Ser. No. 833,832
Int. Cl. B24c 3/08
U.S. Cl. 51—14 36 Claims



A movably supported trolley includes workpiece-engaging means for holding an article to be treated as by abrasive blast cleaning and also includes a drive for moving the trolley independently of any other trolley in and around the treating area for the workpiece.

3,603,038
INTERNAL GRINDER FOR STEEL INGOT MOULD
Yoshikane Manabe, Fukuoka-ken, Japan, assignor to Fujiki Kousan Kabushiki Kaisha, Kita-Kyushyu-shi, Fukuoka-ken, Japan
Filed Jan. 19, 1970, Ser. No. 3,649
Int. Cl. B24b 7/02
U.S. Cl. 51—35 5 Claims



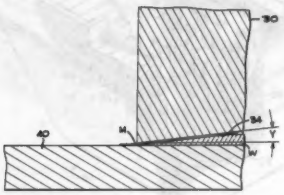
An elongated arm having a grinding wheel turnably mounted at its front end is supported by a cylindrical bearing to rotate about an axis of the arm. The bearing is pivotally received upon a work head which is reciprocal for a predetermined length on a carriage. At the lower fore portion of the bearing, there is provided adjusting means to adjust the angle of elevation of the arm. The adjusting means runs along the upper surface of a copying surface plate, the surface plate also being adjustable in its angle of elevation.

3,603,039

METHOD OF AND APPARATUS FOR MACHINING ARTICLES

Donald F. Stahr, Johnstown, and Rudolph M. Yandrick, Indiana, both of, Pa., assignors to FMC Corporation, San Jose, Calif.

Filed June 3, 1969, Ser. No. 829,961
Int. Cl. B24b 9/06
U.S. Cl. 51—125 10 Claims



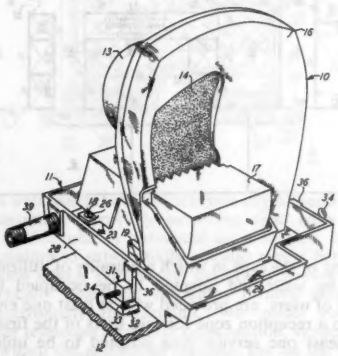
A beveled edge is formed on a very thin, cylindrical silicon wafer by depositing a quantity of diamond lapping material on the upper peripheral edge portion of the wafer and bringing a rotating, hard steel tool down into engagement with the edge portion of the wafer, the tool having a water-engaging face which is beveled at the desired angle.

3,603,040

DENTAL MODEL TRIMMER WITH A COMBINED MOUNTING SUPPORT AND SEDIMENT TRAY

Werner A. Paterson, 3222 North Main, Racine, Wis.

Filed Sept. 18, 1969, Ser. No. 859,001
Int. Cl. B24b 55/02
U.S. Cl. 51—125 5 Claims



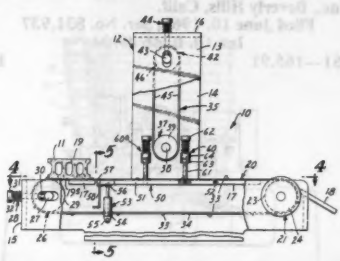
A dental model trimmer with a combined mounting support and sediment tray. A hollow trimmer housing encloses a grinding wheel, and water is directed into the housing and a drain extends from the housing to have the water flow into the tray below the housing. A drain hole is spaced above the level of the tray floor, and the water can drain out the hole while the sediment remains on the tray floor, and the drain hole will therefore not be clogged. Mounting means and fasteners are provided for securing the trimmer to the combined mounting support and sediment tray, such that the trimmer is removable from the combined mounting support and sediment tray, and the tray is releasably attachable to the bench or the like.

3,603,041

BLOCK-GRINDING APPARATUS

William J. McDonald, Stillwater Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 23, 1969, Ser. No. 818,657
Int. Cl. B24b 21/12
U.S. Cl. 51—138 7 Claims



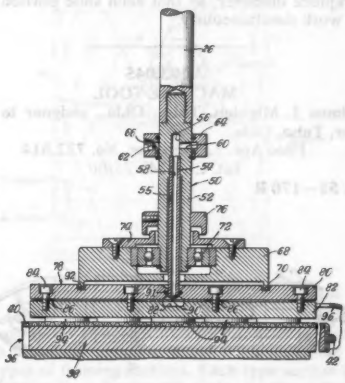
A grinding apparatus wherein a block to be abraded is transferred to and held on a constant load bed which, through pivotable connections and constant force fluid cylinders, maintain said block in engagement with an abrasive material and pivotably accommodates varying geometric shapes of blocks in order to control the grinding depth over the facial surface and thus minimize the removal of material required to permit all portions of a facial surface, although possibly irregular, to be abraded to at least a predetermined grinding depth.

3,603,042

POLISHING MACHINE

Stephen A. Boettcher, Deerfield, Ill., assignor to Speedfam Corporation, Skokie, Ill.

Filed Sept. 20, 1967, Ser. No. 669,177
Int. Cl. B24b 5/00, 55/02
U.S. Cl. 51—131 9 Claims



A polishing machine load plate unit to which workpieces are affixed for polishing, and through which fluid is directed for effecting cooling of the unit.

3,603,043

COHERED YARN FABRICS AND METHOD FOR FORMING SAID YARN

Paul Paliyenko, Charlotte, and Stanley Rollinson, Salisbury, both of, N.C., assignors to Fiber Industries, Inc.

Continuation-in-part of application Ser. No. 708,621, Feb. 27, 1968, now abandoned. This application Dec. 5, 1968, Ser. No. 786,811
Int. Cl. D02g 1/16; D03d 13/00; D04b 1/14
U.S. Cl. 57—140 8 Claims

A knitted or woven fabric and the process for preparing such fabrics from continuous filament yarns cohered by

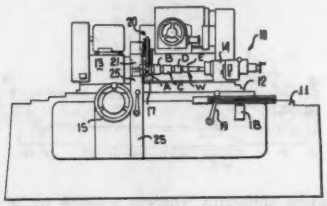
means of double opposed pneumatic false-twisting jets whereby the yarns have a spreadability factor not greater than about 11.

3,603,044

GAUGE MECHANISM FOR GRINDING MACHINES

Ralph E. Price, Waynesboro, Pa., assignor to Litton Industries, Inc., Beverly Hills, Calif.

Filed June 10, 1969, Ser. No. 831,937
Int. Cl. B24b *49/04*
U.S. Cl. 51—165.91 19 Claims



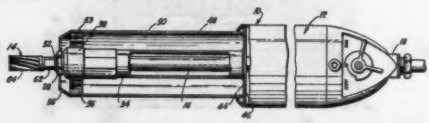
This disclosure relates to automatic machines for grinding workpieces having axially spaced portions of different diameters, and particularly relates to a gauge mechanism which is used to determine the unground diameter of each workpiece portion to assure that the workpiece is within certain tolerances so that the grinding wheel may be advanced rapidly to a point just out of contact with the workpiece before reducing the rate of approach for the grinding feed. The gauge mechanism includes a workpiece-engaging element or caliper of a chordal type having upper and lower shoe portions and a centrally located gauging probe member which is movable to cover a wide range of workpiece diameters. The work-engaging element is suspended by pivoted links of different lengths to permit the centerline of the probe to pass through or near the center of the workpiece, regardless of the workpiece diameter, so that each shoe portion will contact the work simultaneously.

3,603,045

MACHINE TOOL

Perceptimus J. Mighton, Tulsa, Okla., assignor to Mary C. Harter, Tulsa, Okla.

Filed Apr. 1, 1968, Ser. No. 722,814
Int. Cl. B24b *23/00*
U.S. Cl. 51—170 R 2 Claims



A cutting or machining tool threadedly secured directly to the output shaft of an air motor, or the like, and having means for directing the air which operates the motor onto the cutting tool to keep the tool cool during a machining operation, thus precluding undue heating of the tool and the workpiece.

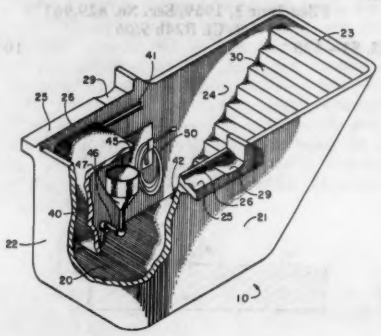
3,603,046

AUTOMOBILE SERVICING UNIT

Stanley Humphrey, Jr., 2924 Indiana N.E., Albuquerque, N. Mex.

Filed May 8, 1970, Ser. No. 35,752
Int. Cl. E04h *14/00*
U.S. Cl. 52—173 13 Claims

A unit to accommodate a person and over which an automobile may be positioned to allow the person access to the underside of the automobile, including an open enclosure having a stairway providing ingress and egress thereto, a doorway closable over the opening to prevent unauthorized



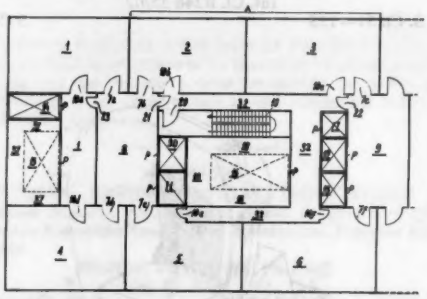
access to the enclosure, and means for positioning the car at a location allowing access to the desired portions of the underside of the automobile.

3,603,047

BUILDING AND INTERIOR ARRANGEMENTS THEREOF

Max Tournier, 54 rue Bonaparte, Paris 6 eme, France

Filed Sept. 8, 1967, Ser. No. 666,328
Claims priority, application France, July 6, 1967, 113294
Int. Cl. E04h *3/02*
U.S. Cl. 52—30 3 Claims



Building of the type in which a plurality of utilization areas defined by walls and adapted to be occupied by a first category of users, are provided with at least one entry giving access to a reception zone for said users of the first category and at least one service area adapted to be utilized by a second category of users for the reception and/or the handling of objects. Means are present for enabling the objects and the users of the two above-mentioned categories to circulate between the utilization areas, the service area, and the reception zone.

3,603,048

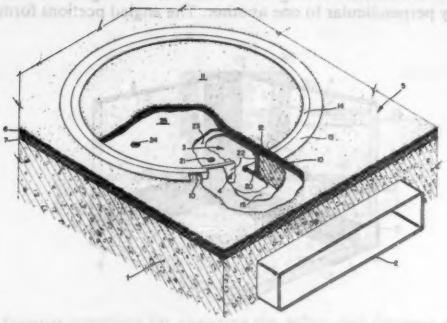
CARPET-UNDERFLOOR ADAPTER

Robert W. Hadfield, Belpre, Ohio, and William H. Harding, Parkersburg, W. Va., assignors to Textron Inc., Providence, R.I.

Filed Apr. 2, 1970, Ser. No. 25,050
Int. Cl. E04f *19/08*
U.S. Cl. 52—221 3 Claims

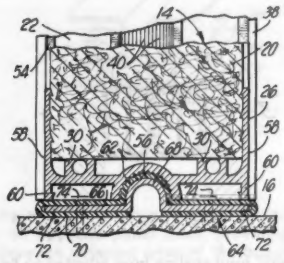
A unitary piece for mounting on the cover of an electrical underfloor access unit or the cover of a junction box unit.

While the adapter permits floor carpet to be installed directly over the unit and thereby preserve carpet continuity, it



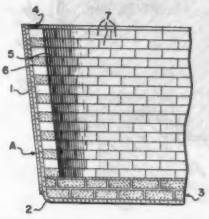
nevertheless provides ready access to the cover for maintenance and/or conductor installation purposes.

3,603,049
WALL PANEL CONSTRUCTION AND ASSEMBLY INCLUDING IMPROVED EDGE AND BOTTOM SEALING
William C. Pierce, Glendora, Calif., assignor to Joseph A. Garcia, Encino, Calif. and Roy C. Garcia, Panama City, Panama, part interest to each
Continuation-in-part of application Ser. No. 661,854, Aug. 21, 1967, now abandoned. This application Aug. 18, 1969, Ser. No. 850,742
Int. Cl. E04c 1/10
U.S. Cl. 52—241 **3 Claims**



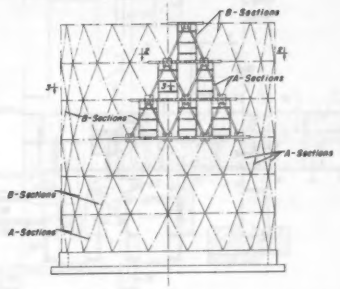
Upright wall panels have vertical side edges thereof aligned and continuously vertically extending side edge opening recesses, semicircular in horizontal cross section, aligned to form an assembled substantially circular recess between assembled side edges, each recess preferably having continuously vertically extending serrations formed therein and spaced horizontally therearound. The panel side edges horizontally telescope a circular cross section, vertical tie bar received within the assembled recesses, the tie bar having a resilient material sleeve the entire vertical extent of said panel side edges horizontally compressed over and inwardly between the recess serrations. At the same time, opposite face surface flanges at one of the panel side edges telescope and horizontally abut similar face surface flanges of the other panel side edge. Bottom edges of the assembled panels rest downwardly on a baseplate having an upwardly extending, semicircular projection received upwardly into downwardly opening, similar serration formed recesses at the panel bottom edges and a resilient material strip covering the baseplate is compressed over the baseplate projection over and between the serrations of the panel bottom edge recesses. Also, parts of the panel bottom edges at opposite face surfaces thereof downwardly compress the resilient material strip against the baseplate and the resilient material strip extends and is compressed beneath the under surface of the baseplate and a horizontal supporting surface.

3,603,050
LADLE LINING
Myron Coleman, R.D. #1, Irondale, Ohio
Filed Aug. 22, 1969, Ser. No. 852,346
Int. Cl. C21b 7/06
U.S. Cl. 52—249 **5 Claims**



A ladle having a curved conical sidewall provided with a lining comprising stacked courses of refractory blocks disposed with horizontal top and bottom faces and provided with parallel front and back faces inclined at substantially the same angle as the ladle sidewall to provide a lining face which is smooth and continuous.

3,603,051
LARGE-DIAMETER FRAMED STRUCTURE
Frederic G. Lussky, Northfield, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Feb. 5, 1970, Ser. No. 8,786
Int. Cl. E04g 11/06
U.S. Cl. 52—245 **5 Claims**

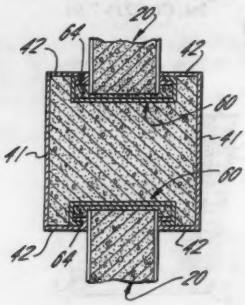


A large-diameter structure of structural framing and side paneling is provided from the use of alternating tiers of two different types of framing sections. Each type section is of an A-frame form with a horizontal girder section adapted to have its ends linked to adjacent sections so as to form circular tiers; however, one type of section has a straight horizontal girder with mitered ends so as to form a resulting ring, while the second type of section has its horizontal girder section fabricated with a central bend at the zone of the apex of the A-frame member. Vertically, the A-frame sections in one tier are staggered with respect to those in a next adjacent tier.

3,603,052
BUILDING CONSTRUCTION SYSTEM
Jose M. Novoa, 390 Sarg Luis Medina St., Hato Ray, P.R.
Filed Dec. 26, 1968, Ser. No. 787,062
Int. Cl. E04b 1/16, E04c 2/50
U.S. Cl. 52—257 **6 Claims**

Molds are provided in the improved construction arrangement which can be put together in various ways for various

shapes of columns, walls and the like construction elements, to prefabricate such elements on the construction site itself.

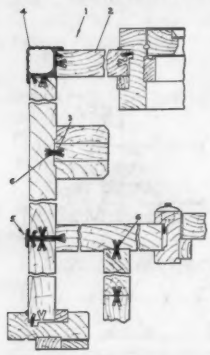


The molds become permanent parts of the prefabricated parts and remain in the final construction assembly of the building.

3,603,053
WALL CONSTRUCTION

Johannes Van Loghem, 83 Sophia Street, and Johannes La Grouw, Le Wairon Road, both of Rotorua, New Zealand

Continuation-in-part of application Ser. No. 559,566, June 22, 1966, now Patent No. 3,416,275. This application Dec. 16, 1968, Ser. No. 783,890
Int. Cl. E04b *1/40*
U.S. Cl. 52—285 **1 Claim**



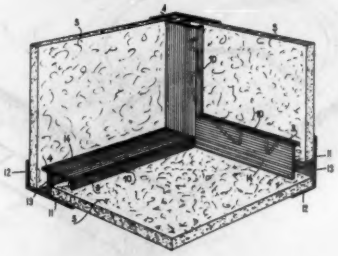
A wall construction of timber planks connected by connecting members with dovetailed slots provided in the planks arranged to be engaged by dovetailed projections on the connecting member. The slots are greater in depth than the dovetailed projections and a clearance area is provided adjacent to the center of the connecting member so that the dovetailed projection may move into the dovetailed slot and then move along the dovetailed slot with a minimum of frictional engagement until the timber planks being joined come together whereupon the dovetailed projections are tightened in the respective dovetailed slots.

3,603,054
RECTANGULAR CROSS SECTION MEMBER HAVING TWO PERPENDICULAR ENTRY CHANNELS

Yves Didry, 44 Avenue Paul Vallant, Montreuil Sous Bois, France

Filed Oct. 24, 1968, Ser. No. 770,204
Claims priority, application France, Oct. 26, 1967, 126,020
Int. Cl. E04b *2/58, 2/82*
U.S. Cl. 52—282 **3 Claims**

A plurality of panels may be assembled in a mutually perpendicular relationship so as to have their adjacent cooperating outer peripheral portions flush to one another by means of assembling the panels within channeled joining members. The joining members include integral angled portions defining two channels having their entrances arranged substantially perpendicular to one another. The angled portions form



an angled outer wall and an inner flange where the flange includes overhanging lip portions which partially obstruct the entrances to the channels. The channel entrance obstructions are arranged only on the internal flange so as to allow the panels to be arranged flush with one another when they are assembled in mutually perpendicular planes.

3,603,055
JOINT-SEALING HOSE

Oivind Dale, Ostre Kamford, Sandefjord, Norway, assignor to Olav Dale

Filed Dec. 2, 1968, Ser. No. 780,526
Claims priority, application Norway, Dec. 4, 1967, July 31, 1968, 170,814;3003/68
Int. Cl. E04b *1/36*
U.S. Cl. 52—403 **8 Claims**

An elastomeric joint-sealing hose adapted to be inserted in the joint between a pair of members, wherein the hose is constructed of a pair of elongate tubes interconnected along one portion of their length, each tube having an integral, longitudinally extending, thin partition wall which is placed in tension upon insertion of the hose into the joint whereby the resistance to compression of each tube in the joint will be increased to thereby improve the seal of the joint.

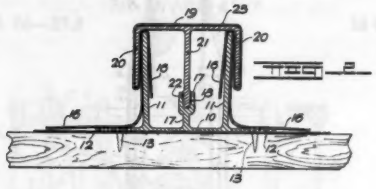
3,603,056
BATTEN SEAM JOINT

Abraham H. Roth, 2526 Fifth Avenue, and Dave Roth, 2490 Barth Drive, both of Youngstown, Ohio

Filed Oct. 30, 1969, Ser. No. 872,697
Int. Cl. E04d *1/36*
U.S. Cl. 52—46 D **3 Claims**

A batten seam joint providing a leakproof joint between adjacent roofing or sheathing member includes a longitudinally extending extrusion having spaced upstanding flanges inwardly from the edges thereof and a centrally disposed bifurcated fastener section. The adjacent longitudinal edges of the roofing or sheathing to be joined are positioned over the upstanding flanges and bent downwardly therebetween and a cap strip of the roofing or sheathing material is formed with longitudinally extending down turned flanges which are doubled and of a size to fit over the spaced upstanding flanges of the extrusion. A plurality of cut sections of a dif-

ferent extrusion are positioned at intervals in the cap strip and these cut sections include centrally disposed depending



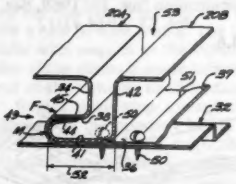
fastener members for engaging the bifurcated fastener so as to hold the cap strip securely in position and complete the batten seam joint.

3,603,057

BUILDING WALL PANEL AND SIDE JOINTS THEREFOR

Bernard E. Curran, Sewickley, Pa., assignor to H.H. Robertson Company, Pittsburgh, Pa.

Filed Mar. 25, 1969, Ser. No. 810,147
Int. Cl. E04c *2/08, 2/46;* E04d *3/362*
U.S. Cl. 52—478 6 Claims



A building wall panel having improved marginal connecting means on opposite panel sides, providing an improved side joint between adjacent ones of the building wall panel. One marginal connecting means comprises a channellike female lip presenting opposed inner surfaces. The other marginal connecting means comprises a male lip including a reverse turned flange presenting a free edge. When the male and female lips are interengaged, the free edge of the reverse turned flange is resiliently urged into line contact along substantially its entire length with one of the opposed inner surfaces thereby to provide a gasket-free, essentially weathertight joint.

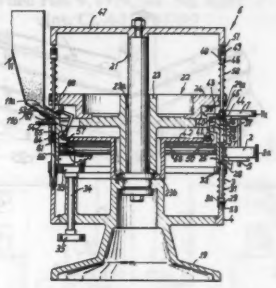
3,603,058

METHOD AND APPARATUS FOR THE PRODUCTION OF COMPOSITE FILTER TIPS

Bernhard Schubert, Neubornsen, near Hamburg, Germany, assignor to Hauni-Werke Korber & Co. K.G., Hamburg-Bergedorf, Germany

Filed Aug. 29, 1968, Ser. No. 756,221
Claims priority, application Great Britain, Sept. 5, 1967, Sept. 11, 1967, 40466/67;51345/67
Int. Cl. B31b *43/00;* B65b *1/22, 5/10*
U.S. Cl. 53—126 39 Claims

A filter tip which contains at least one charge of granular filter material is produced by moving a prefabricated upright tube sideways and introducing seriatim into the tube a first section of a filter plug, a charge of granular filter material, and a second section of the filter plug. The charge is formed immediately prior to introduction into the tube in a metering chamber which is adjacent to the upper end of the tube, and the first section is severed from the filter plug immediately



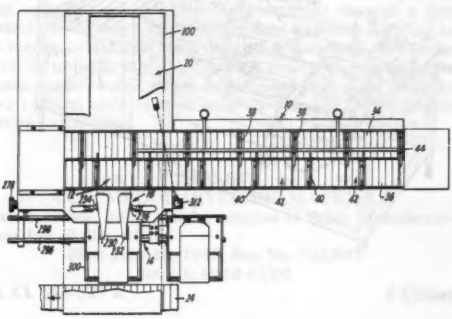
prior to introduction through the upper end of the tube. The charge can be introduced in a current of air and/or by gravity.

3,603,059

UNIVERSAL BAGGER

Roy W. Carnes, Henrico County; Fred D. Marasso, Richmond, and Robert E. Rademacher, Henrico County, all of, Va., assignors to AMF Incorporated, N.J.

Filed Sept. 27, 1968, Ser. No. 763,100
Claims priority, application Great Britain, Sept. 29, 1967, 44465/67
Int. Cl. B65b *5/06, 39/02*
U.S. Cl. 53—258 4 Claims



Apparatus for packaging articles, comprising a flighted infeed conveyor for transporting articles to a predetermined position, means for providing an inflated bag at a position spaced from the predetermined position, means for engaging an article at said predetermined position and inserting it into said inflated bag and means extending exterior of the infeed conveyor for changing the size of the flights thereof.

3,603,060

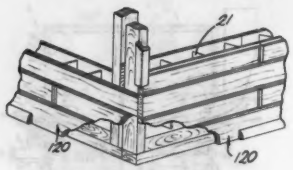
STRUCTURAL BUILDING SYSTEM

Charles Kay, Wyoming, Mich., assignor to J. Raymond Christy Enterprises, Inc., Grand Rapids, Mich.

Filed May 20, 1969, Ser. No. 826,207
Int. Cl. E04b *2/16;* E04c *1/10*
U.S. Cl. 52—281 4 Claims

A low-cost, high quality structural building system of interlocking hollow components which fulfill the structural and decorative requirements of both the interior and exterior surfaces of walls, or both surfaces of interior partitions, floors,

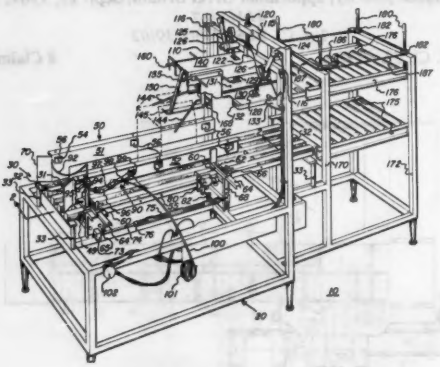
ceilings, and rooves if desired, with windows and doors being interlockable therein, the components collectively enclosing the skeletal structural supports which complement these components, and to which these components are anchored.



3,603,061
BOX-SEALING MACHINE

Oren B. Harmes, Algona, Iowa, assignor to Metronics Incorporated, Algona, Iowa

Filed Feb. 3, 1970, Ser. No. 8,281
Int. Cl. B65b *7/20*
U.S. Cl. 53—374 **18 Claims**



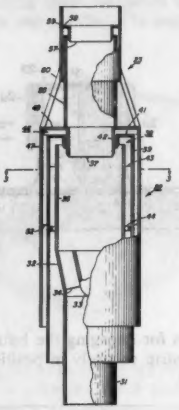
A machine in which an object is conveyed thereon over a predetermined path and varying work functions are performed on the object incident to the movement of a conveyor on the machine and in accord with the operation of a cam follower on a cam surface in which the cam surface is adjustable to vary the frequency in timing of the work function.

3,603,062
GAS-LIQUID SEPARATOR

Charles H. Robbins, Saratoga; George W. Fitzsimmons, San Jose; Robert L. Hughes, Saratoga, and Robert L. Moen, San Jose, all of, Calif., assignors to General Electric Company

Filed Nov. 21, 1968, Ser. No. 777,611
Int. Cl. B01d *45/12*
U.S. Cl. 55—348 **10 Claims**

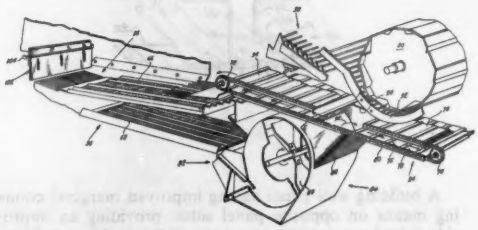
A gas-liquid separating arrangement of high-capacity per unit size including a centrifugal separator for creating a gas vortex surrounded by a liquid vortex having a first discharge passage for receiving separated liquid and a second discharge passage for receiving and separating the gas and liquid of the boundary layer between the gas and liquid vortices and including a centrifugal preliminary dryer for receiving the gas vortex from the separator and for removing additional liquid.



3,603,063
COMBINE

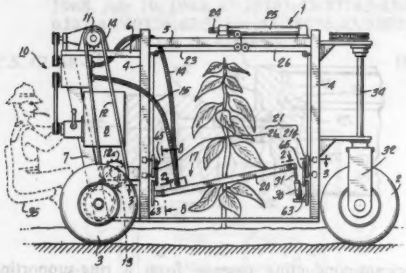
Clark E. Stroburg, and Eldon L. Stroburg, both of, Blockton, Iowa

Continuation-in-part of application Ser. No. 796,749, Feb. 5, 1969. This application Dec. 10, 1969, Ser. No. 883,941
Int. Cl. A01d *41/12*
U.S. Cl. 56—14.6 **14 Claims**



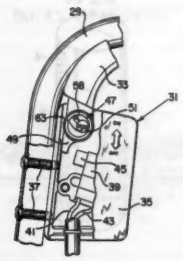
An airflow system for a combine harvester to more effectively float and carry away the straw and chaff and thus increase the efficiency of the separating and cleaning mechanism which includes conveying apparatus, straw walkers, a cleaning shoe mechanism comprising an adjustable chaffer and an adjustable sieve and a fan means for delivering an airflow up through the cleaning shoe mechanism all as is well known. This invention may be used with combines employing either a concave or a concave grate in relation to the threshing cylinder and includes means for utilizing the fan normally providing an undershot airflow to the cleaning shoe mechanism to also provide an overshot flow of air directed to pass intermediate the conveyor apparatus and the threshing cylinder in a rearward direction upwardly through and over the straw walkers and to float the chaff and straw out of the rear of the machine without preventing the heavier grain on the conveyor apparatus from reaching the cleaning shoe mechanism or the grain on the walker from falling either through the openings therein into the trough below or back onto the conveyor apparatus where it can move to the cleaning shoe mechanism. This invention also includes the mounting of a vertically adjustable air flow barrier between the underside of the straw walkers and the rearward end of the cleaning shoe mechanism so that a portion of the airflow will be deflected upwardly and somewhat forwardly relative to the cleaning shoe mechanism and then upwardly through the straw walkers and out of the rear of the machine.

3,603,064
METHOD AND APPARATUS FOR HARVESTING TOBACCO
Jesse R. Pinkham, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed May 19, 1969, Ser. No. 825,625
Int. Cl. A01d 45/16
U.S. Cl. 56—27.5 28 Claims



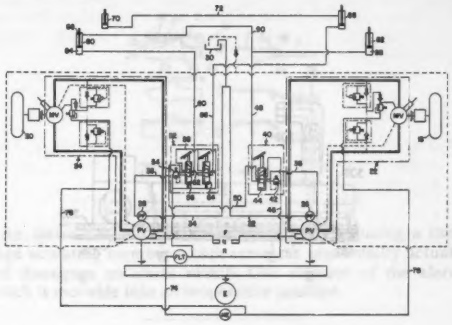
Method and apparatus for defoliating selected sections of tobacco plants comprising forming a frame at least partially surrounding the stalk of the plant at a predetermined upper level and moving the frame downwardly of the stalk to a predetermined lower level, thereby engaging and removing leaves projecting from the stalk between those two levels. The frame is formed by two opposed endless bands running over guide wheels rotating about substantially vertical axes and carried along the row of tobacco plants by a vehicle arranged to straddle a row of such plants. The backward speed of the endless belts with respect to the vehicle on the reach adjacent the stalks of the plants is made substantially equal to the forward speed of the vehicle. Each endless belt carries a series of spaced fingers projecting toward the other band. The projecting fingers on the opposed bands cooperate with the other parts of the bands to define the frames for stripping the leaves from the tobacco stalk.

3,603,065
CAM SAFE SWITCH ACTUATOR
Edwin J. Weber, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.
Filed Sept. 26, 1969, Ser. No. 861,319
Int. Cl. A01d 35/24
U.S. Cl. 56—16.7 18 Claims



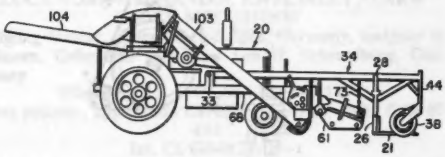
A lawnmower having a housing supported for movement along the ground by a plurality of wheels. A motor-powered reel is supported for rotation upon the housing and cooperates with a bedknife to cut grass. A bale handle extends upwardly from the housing and has a lever-operated switch disposed thereon for actuation of the motor. Novel safety means is provided to selectively prevent actuation of the switch by the lever.

3,603,066
HEADER CONTROL FOR A HARVESTER
Donald E. Burrough, and Joe Paul Leinhauser, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Feb. 9, 1970, Ser. No. 9,851
Int. Cl. A01d 67/00
U.S. Cl. 56—208 5 Claims



A self-propelled windrower has a forwardly disposed transversely elongated header mounted on the main frame of the windrower for independent vertical adjustment of the opposite ends of the header. The position of the opposite ends of the header are respectively controlled by a pair of hydraulic cylinders operative between the main frame and the header at transversely spaced points, one of said cylinders being a master cylinder and the other being a slave cylinder. Both cylinders are simultaneously actuated through a first control valve, which controls the fluid pressure supplied to the master cylinder, so that the opposite ends of the header move in unison, while the header is tilted by actuating a second control valve, which adds or subtracts fluid from the slave cylinder only to raise or lower one side of the header relative to the other.

3,603,067
CUCUMBER-HARVESTING MACHINE
Lewis L. Wilde, Bailey, Mich., assignor to Wilde Manufacturing, Inc., Bailey, Mich.
Filed June 10, 1968, Ser. No. 735,807
Int. Cl. A01d 45/00
U.S. Cl. 56—327 R 5 Claims



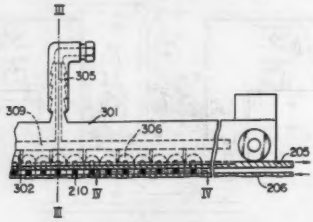
A cucumber-harvesting machine adapted to sever vines from the roots with a knife having variable angle of attack, elevate the vines from the ground with a conveyor, strip cucumbers from the vines with rollers variably spaced horizontally from the discharge end of the elevating conveyor, and transfer the cucumbers to an accumulating station with a conveyor having a transverse section for discharging trash with an upward and lateral movement opposite to the movement of the cucumbers into the station.

3,603,068

APPARATUS FOR FALSE TWISTING

Hirohiko Iida; Kazuyoshi Kida, and Koen Taira, all of Komatsu-shi, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 25, 1969, Ser. No. 810,099
Claims priority, application Japan, Mar. 27, 1968, May 22, 1968, 43/19915;43/34637
Int. Cl. D01h *1/24*
U.S. Cl. 57—104 4 Claims



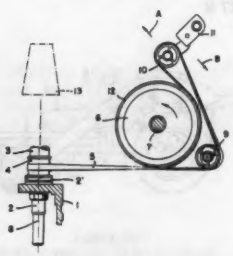
The present invention is intended to false twist a number of continuous filaments or yarns in the sheet form with a compact and inexpensive system comprising much fewer heating and cooling members than conventional false twisters and belt-driven spinners, said sheet form being utilized for treating filaments or yarns by waxing, sizing, etc. and said belt being controlled in driving by pneumatic mechanism so as to enable each spinner to be urged against the belt and to rotate for inserting twist consistent from spinner to spinner to passing continuous filaments or yarns.

3,603,069

BELT-TYPE DRIVE ARRANGEMENT FOR SPINNING MACHINES AND THE LIKE

Aloys Greive, Munster, Westphalia, Germany, assignor to Hamel G.m.b.H. Zwirnerei-und Spinnereimaschinen, Munster, Westphalia, Germany

Filed Apr. 7, 1969, Ser. No. 814,065
Claims priority, application Germany, Apr. 11, 1968, P 17 60 172.8
Int. Cl. D01h *3/16*; F16h *7/00*, *7/08*
U.S. Cl. 57—105 9 Claims



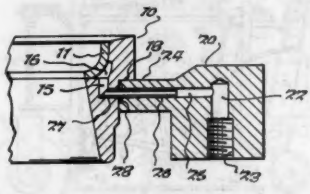
In order to be able to stop a spool on a thread-spinning machine without stopping the drive motor, the drive pulley, which is connected via a belt to the driven pulley of the spool, is coated with a synthetic-resin layer affording a relatively high coefficient of friction while the coefficient of friction of the driven pulley is relatively low. A tensioning pulley enables slackening of the belt so that it will continue to move with the drive pulley but will slip on the driven pulley.

3,603,070

LEAKAGE-PREVENTING CONSTRUCTION FOR SPINNING RINGS

Hyatt B. Atwood, Buffalo, and James N. McLean, Tonawanda, both of, N.Y., assignors to Herr Manufacturing Company, Inc.

Filed Sept. 23, 1969, Ser. No. 860,289
Int. Cl. D01h *7/62*
U.S. Cl. 57—120 4 Claims



A lubricant-conducting passage from a ring-supporting member to a spinning ring is provided. A depression is formed between abutting surfaces of passages and provides a leakproof construction for lubricant passing from the member to the ring. The structure has particular application to various types spinning machines.

3,603,071

CORDS FOR ANNULAR REINFORCING TIRE BELTS

Kevin B. O'Neil, Akron; Cameron R. Fraser, Cuyahoga Falls, Ohio, and Paul E. Helms, Jr., Fort Knox, Ky., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 22, 1970, Ser. No. 30,973
Int. Cl. B60c *9/02*; D02g *3/04*, *3/48*
U.S. Cl. 57—140 BY 10 Claims

A cord composed of merged or cabled yarns of fiberglass and polyester for reinforcing tire belts.

3,603,072

LIQUID ANNULAR ORIFICE DASHPOT TIMER WITH MODIFIED LIQUID

David S. Breed, Box 270, R.D. #2, Boonton, N.J.

Continuation-in-part of application Ser. No. 816,132, Dec. 9, 1968, now Patent No. 3,563,025, which is a continuation-in-part of application Ser. No. 770,215, Oct. 24, 1968, now abandoned. This application Jan. 8, 1970, Ser. No. 1,340
Int. Cl. G04f *1/00*
U.S. Cl. 58—1 28 Claims

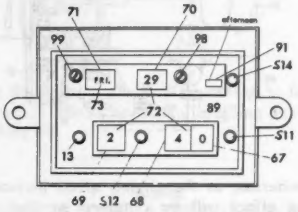
The dashpot of this invention includes a substantially cylindrical glass tube in which travels a piston having a diameter slightly less than that of the interior of the tube. A modified liquid or gum defines the medium in the cylinder in which the piston is adapted to travel. The flow ingenerated in the cylinder is predominantly a pressure flow with the shear flow being relatively insignificant. The device of the present invention operates in the lubrication region whereby relatively small timers are capable of providing delays up to several months or more.

3,603,073

ELECTRIC TIMEPIECE

Kinji Terada, Toyota, Aichi; Tokuzo Inariba, Nishikasugai-gun, Aichi; Atsumu Hiraiwa, Nagoya, Aichi, and Takeshi Taniguchi, Fuwa-gun, Gifu, all of, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Aichi Prefecture, Japan

Filed Mar. 26, 1969, Ser. No. 810,560
Claims priority, application Japan, Mar. 29, 1968, June 4, 1968, June 13, 1968, June 13, 1968, July 8, 1968, July 10, 1968, July 10, 1968, 43/20101;43/37763;43/43/0227;43/40226;43/57396;43/58076;43/58075
Int. Cl. G04b *19/24*
U.S. Cl. 58—6 18 Claims



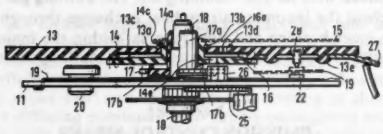
An electric timepiece indicates time by numerals which appear in openings provided on a casing surface of the timepiece. A time indicator mechanism includes time indication elements operable every unit of time such as a minute, a 10 minute interval, an hour and so forth. The driving force of a motor operates according to pulse signals applied at given intervals of time is transmitted selectively to the time indicator mechanism through a driving force transmission mechanism. The transmission mechanism selectively actuates the time indicator mechanism to advance the minute time indication element at each operation of the motor. An advance mechanism responds to movement of each time indication element to its highest numeral, and constrains the transmission mechanism to selectively actuate the time indicator mechanism so as to advance the next higher order time indication element one step.

3,603,074

CLOCKWORK-TIME SWITCH

Wolfgang Ganter, Schramberg-Sulgen, and Heinz Otto, Rotenberg, both of, Germany, assignors to Messrs. Gebruder Junghans GmbH, Schramberg, Germany

Filed Nov. 26, 1969, Ser. No. 880,171
Claims priority, application Germany, Nov. 29, 1968, G 68 09 258
Int. Cl. G04b *29/04*
U.S. Cl. 58—16 10 Claims



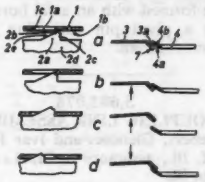
A clockwork mechanism is provided having a return locking spring disposed between a baseplate and an adjustment wheel of the device. The adjustment wheel is formed with a hub having a longitudinal slot so that the hub may be compressed and fit within a hole formed in the baseplate. The indicating hand of the clock may be formed with projections which fit into the slot to prevent the hub from being compressed and removed from the hole. An alarm release spring is mounted within the mechanism and operates in a cantilever manner to actuate and shut off the alarm.

3,603,075

DEVICE FOR LIMITING THE ALARM TIME IN ELECTRIC ALARM CLOCKS

Robert Wolber, Lauterbach, Wurttemberg, and Friedrich Assmus, Schramberg, Wurttemberg, both of, Germany, assignors to Gebruder Junghans G.m.b.H., Schramberg, Wurttemberg, Germany

Filed May 20, 1970, Ser. No. 39,117
Int. Cl. G04c *21/22*
U.S. Cl. 58—20 14 Claims



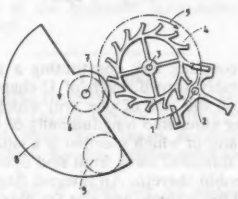
An alarm device for an electrical clock including a two-stage actuating member which serves to sequentially actuate and disengage an alarm switch. One element of the alarm switch is movable into an inoperative position.

3,603,076

TIMEPIECE COMPRISING AN OPTICAL MEANS FOR INDICATING THE BEAT OF THE SECONDS

Xavier Theurillat, La Chaux de Fonds, Switzerland, assignor to Mondia S.A., La Chaux de Fonds, Canton of Neuchatel, Switzerland

Filed May 27, 1970, Ser. No. 41,003
Int. Cl. G04b *19/06*
U.S. Cl. 58—127 R 5 Claims



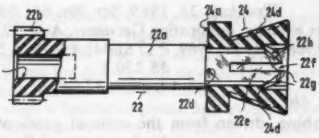
An optical means for indicating the beat of the seconds of a timepiece includes an obturator mounted under the window in the dial of the timepiece. The obturator is mounted on a shaft having a pinion gear engaging a gear wheel on the escapewheel of the timepiece.

3,603,077

CLOCKWORK MECHANISM, ESPECIALLY ALARM CLOCK MECHANISM

Wolfgang Ganter, Schramberg-Sulgen, Germany, assignor to Messrs. Gebrueder Junghans GmbH, Schramberg, Germany

Filed Nov. 17, 1969, Ser. No. 877,149
Claims priority, application Germany, Nov. 18, 1968, G 68 07 494
Int. Cl. G04b *27/00*
U.S. Cl. 58—22.5 6 Claims



A clockwork mechanism is provided having an axially shiftable and rotatable adjustment shaft. The shaft is pro-

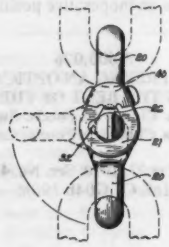
vided at one end with two resilient axially extending projections which have wedge-shaped elements formed on the terminal ends thereof. A knob is provided and is formed with an axial bore having an internal shoulder disposed therein. When the shaft is inserted within the axial bore of the knob, the projections are wedged together until the wedge-shaped elements expand and engage within the wider portion of the bore defined by the internal shoulder thereof. To release the knob from the shaft, a pincer tool is inserted into the bore and the ends of the projections are forced together to disengage them from the internal shoulder. The other axial end of the shaft may be formed with an axial bore which slides and rotatingly about a pivot pin extending normally from a baseplate of the mechanism.

3,603,078

COUPLING LINK ASSEMBLY

Phillip D. Schwiebert, Glencoe, and Ivar H. Norinder, Mundelein, both of, Ill., assignors to MacLean-Fogg Lock Nut Co., Mundelein, Ill.

Filed May 12, 1969, Ser. No. 823,710
Int. Cl. F16g *13/06*
U.S. Cl. 59—85 **4 Claims**



A two-part coupling link constituting a pair of identical members, desirably forged, each of U-shape having a flattened portion on the end of one arm which forms a collar with an opening elongated longitudinally of the arm, and on the remaining arm of which member is a stud which projects outwardly in a direction away from said opening and in concentric relationship thereto. An integral flange on the outer end of the stud has a shape and size for passage through said opening when properly oriented and which is elongated along an axis angularly related to that of the opening. The members are brought together to be joined while in angularly related and opposed dispositions for the insertion of the flange and stud of one member in the opening of the other, and after which the members are extended from one another at dispositions which displace the flange elongations from those of the openings to prevent separation of the members in use and effectively stiffen the members against distortion under extreme loads. An auxiliary clip which grasps sides of one member and has a finger extending into the elongated opening may be used to prevent inadvertent disengagement of the members when not in use.

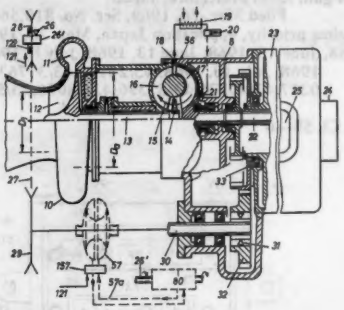
3,603,079

SUPERCHARGED INTERNAL COMBUSTION ENGINE, PARTICULARLY SUPERCHARGED DIESEL ENGINE FOR VEHICULAR DRIVES

Ernst Kickbusch, Eschenhofstrasse 46, 89 Augsburg, Germany

Filed Aug. 21, 1969, Ser. No. 851,855
Claims priority, application Germany, Aug. 22, 1968, Oct. 31, 1968, July 11, 1969, P 17 51 941.4;P 18 06 235.6;P 19 35 230.8
Int. Cl. F02b *37/08*
U.S. Cl. 60—13 **17 Claims**

A turbine, driven from the exhaust gases of the internal combustion engine, and having a speed-flow volume and pressure differential characteristic which is only little speed-dependent drives a Foettinger hydrodynamic torque converter which has a pump element which is highly speed-dependent, a radial flow turbine which is only little speed-dependent, and a guide vane element, the radial flow turbine of the fluid coupling driving a displacement-type rotary compressor so that, even at low engine speeds of the internal combustion engine, substantial supercharging effect can be



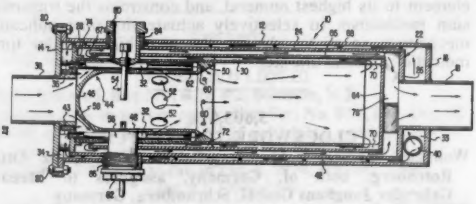
obtained, whereas, as the engine speed increases, less supercharging effect will be obtained so that the average cylinder pressure at low speeds will be increased of cylinder pressure and engine torque will increase with decreasing speed, keeping the output power constant over a wide range of engine-operating speeds.

3,603,080

EMMISSION CONTROL ASSEMBLY

James W. McCrocklin, Alexandria, Va., assignor to A. S. Callaway

Filed June 25, 1969, Ser. No. 836,428
Int. Cl. F01n *3/14*
U.S. Cl. 60—30 **8 Claims**



Inner and outer housings of a combined muffler and emission control device define a passageway for incoming air. Exhaust gas is introduced into the inner housing and is mixed with a portion of the incoming air whereafter it is ignited and then mixed with further incoming air. The burning gas is used to preheat the incoming air by heat exchange through a wall of the inner housing and flow reversal within the inner housing is employed to produce an acoustical muffling effect.

3,603,081

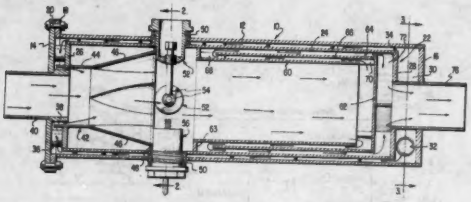
EMISSION CONTROL MEANS

James W. McCrocklin, Alexandria, Va., assignor to A. S. Callaway

Filed June 25, 1969, Ser. No. 836,471
Int. Cl. F01n *3/14*
U.S. Cl. 60—30 **2 Claims**

The mixing chamber of a combined acoustical muffler and afterburner receives exhaust gas and air at one end and beyond this region the chamber is provided with divergent cusps to form an expansion chamber wherein the exhaust gas and air are mixed and their velocity decreased for discharge through an ignition and burning zone. The ignition and burn-

ing zone is formed by a plurality of radially inwardly directed flame holding rods for sustaining the flame and a similarly located ignition device for initiating the flame. Downstream



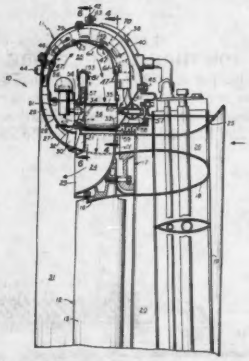
of this zone the burning gas may be caused to follow a tortuous path which effects acoustical muffling and preheating of the incoming air.

3,603,082

COMBUSTOR FOR GAS TURBINE HAVING A COMPRESSOR AND TURBINE PASSAGES IN A SINGLE ROTOR ELEMENT

Ralph J. Sneeden, Boxford, Mass.; Neil R. Brookes, Topsfield, Mass., and Hargus Watts, Hawthorne, N.J., assignors to Curtiss-Wright Corporation

Filed Feb. 18, 1970, Ser. No. 12,228
Int. Cl. F02c *3/06*; F02k *3/06*
U.S. Cl. 60—39.36 **18 Claims**



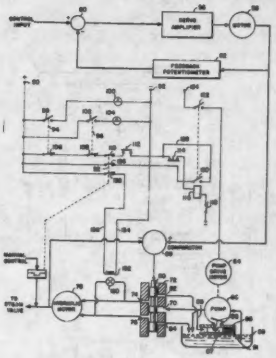
In a gas turbine engine having a compressor and turbine passages in a single rotor element, a combustor of annual, toroidal configuration comprises a segmentally constructed liner defining a combustion chamber providing a flow path of at least about 180° and spaced from a housing or shroud to define a diffusing combustion air supply passageway communicating with the annular outlet means of the compressor. The combustion chamber is provided with inlet means to receive air from the diffusing passageway and an outlet in communication with the turbine nozzles formed between next adjacent stator blades. Each of the stator blades has passage means therethrough to communicate the diffusing passageway with the combustion chamber inlet means to pass combustion air from the diffusing passageway to the latter and effect cooling of the stator vanes and heating of the combustion air. The liner has slip joints so constructed and arranged that unrestrained expansion and construction can occur while maintaining a constant diffusing passageway dimensional characteristics.

3,603,083

HYDRAULIC ACTUATOR

Richard Carl Coursen, Yardley, Pa., assignor to De Laval Turbine Inc., Trenton, N.J.

Filed Feb. 16, 1970, Ser. No. 11,670
Int. Cl. F15b *15/18*
U.S. Cl. 60—52 CD **7 Claims**



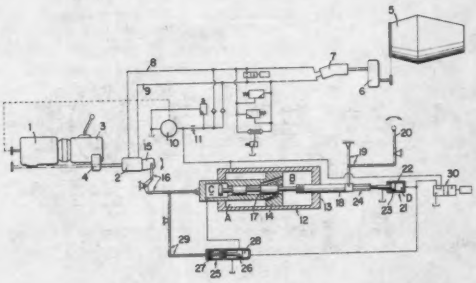
A servomechanism for use in controlling steam valves of turbines comprises a remote electrical servo arranged to drive a local hydraulic servo, which actuates the valves. Provision is made for manual actuation of the valves, with an interlock which prevents the hydraulic servo from being reactuated when the error signal is off zero by a predetermined amount. The interlock automatically bypasses driving oil at the ports of the hydraulic servomotor when manual control is effected.

3,603,084

APPARATUS FOR DRIVING A DEVICE MOUNTED ON SPECIAL-PURPOSE VEHICLES

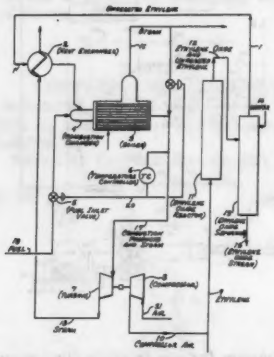
Takashi Okazaki, Hyogo-ken, Japan, assignor to Shinmeiwa Kogyo Kabushiki Kaisha, Nishinomiya-shi, Hyogo-ken, Japan

Filed July 31, 1969, Ser. No. 846,436
Int. Cl. F15b *15/18*
U.S. Cl. 60—52 VS **7 Claims**



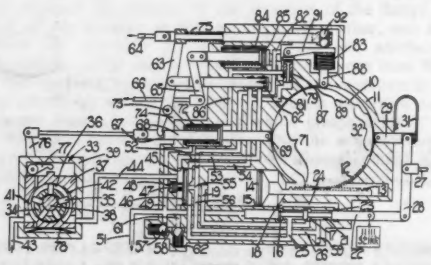
An apparatus for driving a device mounted on special-purpose vehicles and the like having an engine, including a hydraulic pump driven by the engine and a hydraulic motor driven by the pump for driving said device. The pump is typically of a swashplate type with the tilting angle thereof being adjustable through a hydraulic piston and cylinder device incorporating a changeover valve by means of a manual operation lever. Another changeover valve is provided for switching the apparatus to an automatic operation in which the rotational speed of the hydraulic motor is kept constant irrespective of the rotational speed of the engine.

3,603,085
PROCESS FOR THE PRODUCTION OF ETHYLENE OXIDE
Mario Parmegiani, San Donato, Milanese, and Anacleto Clementi, Saronno, both of, Italy, assignors to Snam Progetti, S.p.A., Milan, Italy
Filed Feb. 16, 1968, Ser. No. 706,139
Claims priority, application Italy, Feb. 17, 1967, 12759 A/67
Int. Cl. F02c 3/00; C07d 1/14
U.S. Cl. 60—39.02 5 Claims



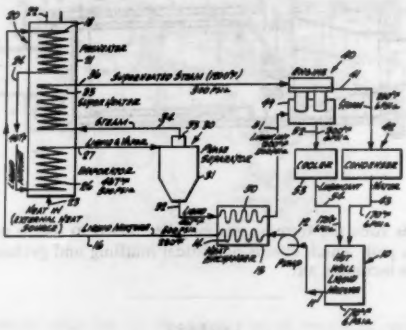
A process for producing ethylene oxide wherein a portion of the gases produced in the process are combusted with supplementary fuel to produce products of combustion that drive a gas turbine-air compressor. The compressed air from the air compressor is returned to the ethylene oxide reactor to be used in the production of ethylene oxide.

3,603,086
FLUID CONTROL APPARATUS
Richard Joseph Ifield, Beecroft, Australia, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Oct. 29, 1969, Ser. No. 872,315
Int. Cl. F16d 31/02
U.S. Cl. 60—53 R 5 Claims



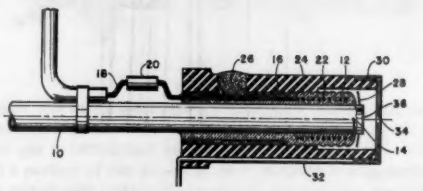
apparatus for controlling the pressure of the fluid delivered by a pump to a pressure responsive means and having a chamber 45 containing a movable member, flow of fluid from one side of the member to the other being through passage means and the outlet pressure being determined by the position of the member in the chamber to control the escape of fluid through an outlet and the pressure drop created by the restrictor being determined by changes in a parameter such as the position of a valve connected to a throttle lever for an associated prime mover for a transmission system in which the apparatus is used.

3,603,087
DUAL FLUID RANKINE CYCLE POWERPLANT
Curtis V. Burkland, Calabasas, Calif., assignor to CCI Aerospace Corporation, Van Nuys, Calif.
Filed June 27, 1969, Ser. No. 837,156
Int. Cl. F01k 7/00
U.S. Cl. 60—64 11 Claims



A dual fluid Rankine cycle powerplant utilizes one fluid, such as water, as the working medium and another fluid, such as a glycol, ether, polyglycol ether (both alkyl and aryl) or polyphenyl as the lubricant. The lubricant is fully soluble in the working medium and has a substantially higher boiling point than the working medium. The two fluids are separated from one another prior to entering the engine by heating the mixture of the two liquids to the evaporation temperature of the working medium and then separating the vapor from the liquid lubricant. Thereafter, the vapor can be superheated to increase the thermal efficiency.

3,603,088
ION THRUSTER CATHODE
Shigeo Nakanishi, Berea, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Adminsitration
Filed May 18, 1970, Ser. No. 38,262
Int. Cl. F03h 1/00
U.S. Cl. 60—202 10 Claims

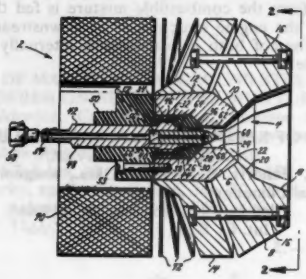


An encapsulated heater forms a hollow body for a cathode used in an ion thruster. A radiation shield surrounds the heater and supports an end cap.

3,603,089
PLASMA ARC THRUSTOR
Donald W. Esker, St. Louis County, and Joseph C. Kroutil, Bridgeton, both of, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.
Filed June 11, 1968, Ser. No. 736,069
Int. Cl. F02k 7/08
U.S. Cl. 60—203 11 Claims

A plasma arc thrustor including a hollow core formed from an electrically conductive substance capable of withstanding extremely high temperatures, and radiation flanges engaging the core and formed from a different but lighter material which is capable of conducting heat away from the core. An

arc is maintained between an electrode in the hollow portion of the core and a composite electrode consisting of the core



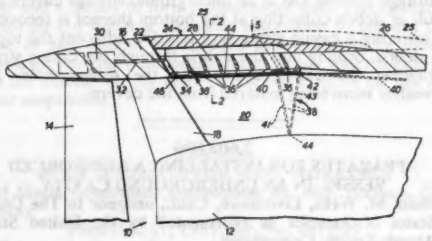
and one of the radiation flanges. A coil is located in offset relation to the arc, and radiation shields are interposed between the coil and the radiation flanges.

3,603,090

THRUST REVERSER FOR FAN TYPE JET PROPULSION ENGINES

Brian Arthur Billinger, Worsthrorne, near Burnley; Francis Peter MacNamara, Nelson, and George Samuel Cooper, Rawtenstall, all of, England, assignors to Rolls-Royce Limited, Derby, England

Filed Aug. 5, 1969, Ser. No. 847,556
Claims priority, application Great Britain, Aug. 8, 1968, 37,881/68
Int. Cl. F02k *1/20, 3/06;* **B64c** *15/06*
U.S. Cl. 60—226 **2 Claims**



In a gas turbine jet propulsion fan engine, the fan duct outer wall is provided with primary and secondary fan air blocker flaps. In the nonoperative position, both sets of flaps cooperate to provide a continuous duct outer wall and in the operative position, the primary flaps fold upon themselves across the duct so as to block it and the secondary flaps translate rearwards, the effect being to provide a radial outlet for the fan air, which outlet is substantially clear of structure.

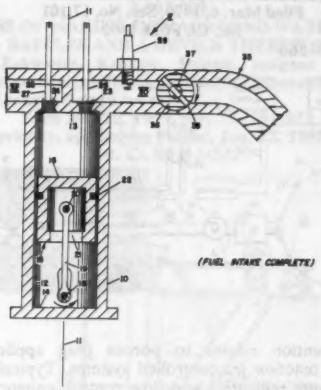
3,603,091

INTERNAL COMBUSTION ENGINE

Bernhardt Stahmer, 1509 Chicago Street, Omaha, Nebr.

Filed June 26, 1969, Ser. No. 836,904
Int. Cl. F02k *7/06;* **B63h** *11/14*
U.S. Cl. 60—247 **2 Claims**

An internal combustion engine wherein successive finite gravimetric quantities of a gaseous thermally explodable medium are at periods of a given time interval compressed by a compression means through the closeable entrance port of a fixed partition wall into a constant volume explosion chamber where each successive gravimetric quantity is exploded in complete isolation from the compression means, substantially all the resultant gaseous combustion product being exhausted intermittently pulsewise from the explosion chamber through an exhaust channel leading away from the compression means and the fixed partition wall. The exhaust channel, downstream from the explosion chamber, has means



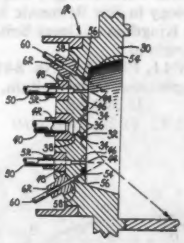
to convert the intermittent pulse wise exhaust into useful work, including novel motive power for marine craft.

3,603,092

INJECTION HEAD FOR DELIVERING LIQUID FUEL AND OXIDIZERS

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, Martin G. Drexhage

Filed Sept. 24, 1969, Ser. No. 860,635
Int. Cl. F02k *9/02*
U.S. Cl. 60—258 **4 Claims**



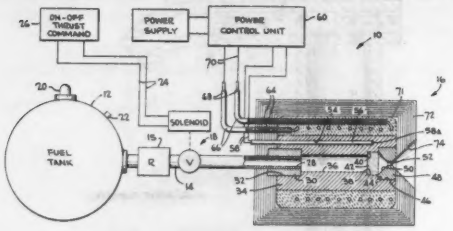
An injection head for delivering liquid fuel and oxidizers to the thrust chamber of a reaction engine, characterized by a plurality of circumferentially arranged sets of radially aligned inner and outer fuel injection orifices, each set having an oxidizer injection orifice radially aligned therebetween, with each orifice of each set of orifices being adapted to deliver a stream intersecting the streams delivered by the other orifices of the set in a manner such that the velocity of the streams of fuel delivered from the inner and outer fuel injection orifices is sufficient to cause a portion of the stream delivered from the oxidizer injection orifice to be mixed with the stream delivered from the outer orifice and to be deflected along the wall of the thrust chamber so as there to establish a fuel-rich, cooler-burning region, while elsewhere achieving optimized mixing, whereby the temperature within the regions adjacent to the wall of the thrust chamber is maintained at an operative level substantially below that experienced elsewhere in the thrust chamber.

3,603,093

HEATED POROUS PLUG MICROTHRUSTOR

William C. Isley, Hyattsville, and William C. Lund, New Carrollton, both of, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Mar. 6, 1970, Ser. No. 17,101
Int. Cl. F02k 9/02
U.S. Cl. 60—260 5 Claims



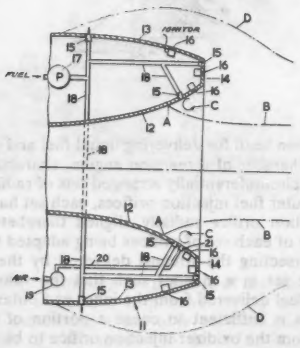
The invention relates to porous plug application in spacecraft reaction jet controlled systems. Typical uses include pressure regulation and flow control, enhancement of propellant disassociation and augmentation of heat transfer rays of propellants. For heated applications, operating temperature of the porous plug can be achieved using a resistance element, or, alternatively, a radio isotope source in the form of a porous plug, for purposes of controlling mass flow rate of propellant and improving specific impulse. Also, the porous plug, in the heated embodiment may incorporate a high-heat capacity media for improving thermal storage properties. For unheated applications, the porous plug is utilized to provide both a stable passive liquid-vapor interface and a means for effecting contaminated insensitive pressure reduction device. Typical applications of the porous plug system are in station keeping and attitude control reaction jet systems for earth satellites.

3,603,094

AIRCRAFT FLUID JET REACTION ENGINES

Lionel Henry Townend, Farnborough, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed July 11, 1969, Ser. No. 841,068
Claims priority, application Great Britain, July 15, 1968, 33,543/68
Int. Cl. F02k 1/00, 3/10
U.S. Cl. 60—261 8 Claims



An aircraft fluid jet reaction engine having an exhaust nozzle which has means for supplying fuel to form a combustible mixture with the local atmosphere which is ignited by contact with the hot gas efflux from the exhaust nozzle and is burnt externally of said gas efflux. The burning mixture raises the static pressure at the region downstream and adjacent the exhaust nozzle thus reducing base drag and also acts to suppress noise from the gas efflux.

Igniter means are provided for initiating and maintaining combustion.

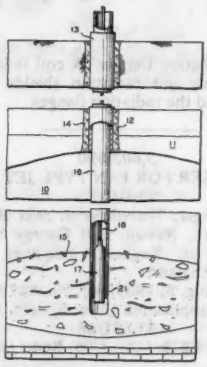
Fuel to form the combustible mixture is fed through fuel nozzles, in the engine structure at its downstream end, and upstream thereof both externally and internally of the exhaust nozzle.

3,603,095

METHOD OF RECOVERING STORAGE VOLUME IN AN UNDERGROUND CAVERN

Hurshel V. Hendrix, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed July 7, 1969, Ser. No. 839,468
Int. Cl. B25g 5/00; E21f 17/16
U.S. Cl. 61—.5 6 Claims



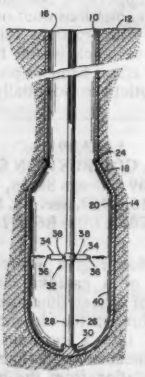
Storage volume lost in an underground storage cavern as a result of debris collecting at the bottom thereof is recovered by lowering a casing string to a position adjacent the top of the debris, drilling into the debris through the casing string, advancing the casing string into the drilled hole, and thereafter recovering material from the cavern.

3,603,096

APPARATUS FOR INSTALLING A REINFORCED VESSEL IN AN UNDERGROUND CAVITY

William M. Wells, Livermore, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission

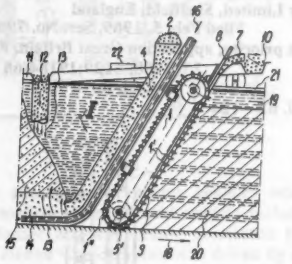
Filed Dec. 10, 1969, Ser. No. 883,703
Int. Cl. B65g 5/00; B05b 13/06
U.S. Cl. 61—.5 1 Claim



A distensible vessel, reduced in diameter by means of folds in its sidewall, is passed through a bore into a cavity and is

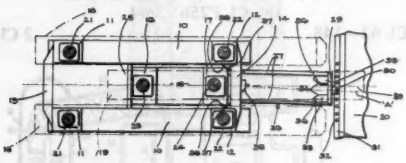
expanded to size by internal pressure. The interior of the vessel is then reinforced by building up a suitably thick deposit of material applied to the walls in an adherent spray by means of an arc-spray gun arranged to traverse the interior of the vessel.

3,603,097
PROCESS OF MAKING UNDERGROUND STRUCTURES FOR UNDERDRAINING AND SHIELDING PURPOSES
Bohdan Zakiewicz, Cracow, Poland, assignor to Przedsiebiorstwo Specjalistyczne Gornictwa Surowcow Chemicznych, Krakow, Poland
Filed Jan. 15, 1969, Ser. No. 791,358
Claims priority, application Poland, Jan. 22, 1968, P 124819
Int. Cl. E02b *11/00*; F16l *1/00*
U.S. Cl. 61—11 **3 Claims**



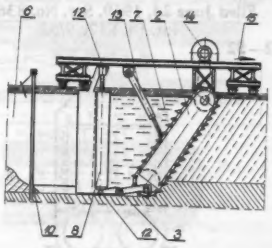
A trench dam is made by an apparatus which digs a trench in a water-permeable ground layer, then lays a perforated drainage conduit in this trench, partially fills the trench over the conduit with gravel to form a porous gravel bed, and then fills the trench over the bed with a mixture of the excavated earth and a binder to form a waterproof wall. This operation is carried out under a silt-water suspension to prevent collapse of the trench walls which are undercut by milling wheels on the lower end of the cutter. Clear water is pumped into the conduit during these operations to drive off this silt-water suspension.

3,603,098
ROOF SUPPORTS FOR MINE WORKINGS
Karl Maria Groetschel, Stolzestrasse 44, 463, Bochum, Germany
Filed Oct. 17, 1969, Ser. No. 867,329
Claims priority, application Great Britain, Oct. 17, 1968, 49359/68
Int. Cl. E21d *15/44*
U.S. Cl. 61—45 **6 Claims**



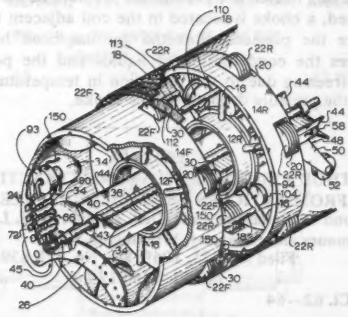
The invention provides a mine roof support in which centering of the outer part of a two-part base element with respect to a longitudinally extending medial reference axis is effected by contact faces which are mutually convergent, as viewed in plan, in a direction towards the forward end of the support, and are formed on two centering elements carried by a longitudinally movable guide element provided on the base of the support, and including a bracket for connection to a conveyor or other transversely extending anchor member at its forward end, these contact faces being presented inwardly and situated close to the reference axis to minimize the transmission of torque about the reference axis to the longitudinally movable guide element due to random vertical friction forces established between the contact faces and the part of the base element engaged thereby during the centering operation.

3,603,099
PROCESS OF MAKING INTRAGROUND WATERPROOF BAFFLES AND A DEVICE THEREFOR
Bohdan Zakiewicz, Krakow, Poland, assignor to Przedsiebiorstwo Specjalistyczne Gornictwa Surowcow Chemicznych, Krakow, Poland
Filed Jan. 15, 1969, Ser. No. 791,472
Claims priority, application Poland, Jan. 22, 1968, 124819
Int. Cl. E02f *5/522*
U.S. Cl. 61—72.1 **2 Claims**



Method of and apparatus for the formation of fluid-impermeable underground walls wherein a trench excavator carrying a roll of flexible waterproof foil is displaced along an excavation line so that, as the trench is cut, the foil is laid in a vertical plane behind the excavator, and the space between the foil and the flanks of the cut is filled.

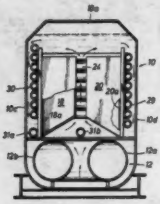
3,603,100
TUNNELLING MEANS AND METHOD
John James Cowley, Toronto, Ontario, Canada, assignor to Cervotec Developments Limited, Toronto, Ontario, Canada
Filed May 5, 1969, Ser. No. 821,898
Int. Cl. E01g *3/03*, *5/06*
U.S. Cl. 61—84 **30 Claims**



A tunnelling machine performs in such a manner that, in a cylindrical tunnel, a radial step from center to periphery advances helically about the axis of the tunnel as material is detached, to advance the locus of the step. A plurality of implements mounted on an arm have a locus corresponding approximately to the desired step direction advance the step by penetrating the material a short distance in advance of the step location and prying it toward the face of the step. Actuation of one or a small proportion of the implements at a time provides large thrust in a concentrated location. Choice of sequence of implement actuation allows compensation for the fact that radially outward parts of the arm advance farther than radially inward parts. Arm advances are alternated with cycles of implement operation. A frame, roller mounted on the walls of the tunnel has the rollers 'skew' to

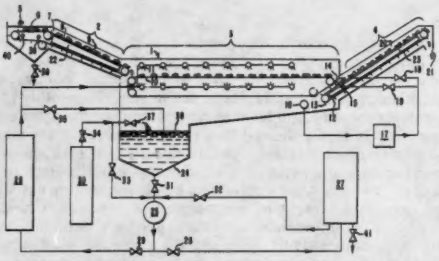
advance the frame helically as it rotates in the tunnel. The frame supports the implement arm and mounts a supply of permanently deformable strip material which is applied under one of the leading frame support members and corrugated thereby to overlap with preceding and succeeding layers to form temporary reinforcement for the tunnel walls. The rear of the frame may be displaced relative to the tunnel walls and the front of the frame with the implements to change the direction of the tunnel. As an incident of the implement actuation, rocks or rocklike material, too hard for the implements, may be sensed for special treatment.

3,603,101
INDIRECT HEATER
Lawrence J. Sullivan, Odessa, Tex., assignor to Sivalls Tanks, Inc., Odessa, Tex.
Filed June 24, 1969, Ser. No. 836,001
Int. Cl. F17c *9/02*
U.S. Cl. 62—52 **3 Claims**



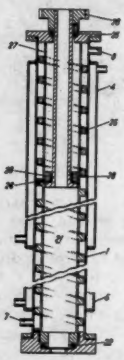
The heater includes a vessel containing a heat transfer fluid and a fire tube located adjacent the bottom to heat the heat transfer fluid. The fluid to be heated flows through a coil located in the vessel above the fire tube but submerged in the heat transfer fluid. The coil encircles two void boxes that occupy a substantial portion of the space in the vessel and reduce the volume of heat transfer fluid required to fill the vessel to a level above the boxes and the coil. The void boxes are spaced apart and positioned relative to the fire tube to cause the heat transfer fluid to flow upwardly between the boxes and downwardly past the coil between the boxes and the walls of the vessel due to the heat convection currents produced by the thermosyphonic effect. When the fluid being heated is a gas and the pressure of the gas is to be reduced, a choke is located in the coil adjacent its outlet to reduce the pressure after the gas has been heated. This reduces the condensation of liquids and the possibility of their freezing due to the reduction in temperature resulting from the pressure drop across the choke.

3,603,102
METHOD AND APPARATUS FOR EXTRACTING HEAT FROM ARTICLES WITH A LIQUID FREEZANT
Edmund O. Banas, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 21, 1969, Ser. No. 878,639
Int. Cl. F25d *17/00*
U.S. Cl. 62—64 **18 Claims**



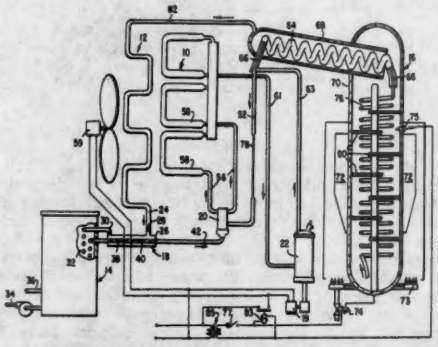
In a method, and apparatus, for extracting heat from articles, as in the freezing of food, by directly contacting the articles with a liquid freezant in an open vessel without significant loss of freezant to the atmosphere, the improvement which comprises: contacting the articles from which heat is to be removed with a liquid, fluorinated, C_1 to C_4 saturated halohydrocarbon, for example, dichlorodifluoromethane, which is at a temperature substantially below, for example, at least 5° C. below, its normal atmospheric boiling point and below the temperature of the articles, for a time sufficient to remove the desired amount of heat and to vaporize at least a portion, but not all, of the liquid; contacting and condensing the vapor with liquid halohydrocarbon as defined above; and collecting, cooling and recycling the liquid halohydrocarbon.

3,603,103
CONTINUOUS CRYSTALLISATION PLANT
Stuart Richmond, Sheffield, and David W. Exley, Barnsley, both of, England, assignors to Newton, Chambers & Company Limited, Sheffield, England
Filed Feb. 5, 1969, Ser. No. 796,678
Claims priority, application Great Britain, Feb. 7, 1968, Apr. 23, 1968, 6129;19184/68
Int. Cl. B01d *9/04*
U.S. Cl. 62—124 **10 Claims**



The conventional Schildeknecht crystallizer has certain disadvantages which may be reduced or overcome if the standard helical conveyor is replaced wholly or in part by a screw conveyor. Furthermore it has been found essential that the finish on the conveyor of a Schildeknecht crystallizer, whether helix or screw or a combination of the two, should be CLA 63 or better for efficient crystal transport.

3,603,104
LIQUID-LEVEL SENSOR
Gerald K. Gable, North Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed June 2, 1969, Ser. No. 829,621
Int. Cl. F25b *15/04*
U.S. Cl. 62—148 **2 Claims**



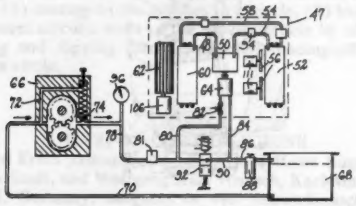
An absorption refrigeration system including generator-solution-level sensing means to prevent heat input to the

generator unless a predetermined minimum amount of solution is present therein.

3,603,105
REFRIGERATION APPARATUS FOR AUTOMOTIVE VEHICLES

Rubin Figa, Mamaroneck, N.Y., assignor to Adelphi Mobile Air Conditioners, Inc., Brooklyn, N.Y.

Filed Sept. 17, 1969, Ser. No. 858,754
Int. Cl. F25b *1/00*
U.S. Cl. 62—230 9 Claims



A refrigeration apparatus for motor vehicles which is powered by the motive power of said vehicle including a compressor, condenser and evaporator connected by appropriate conduit means. The compressor is driven by a constant displacement hydraulic motor which is activated by fluid supplied to it by a variable speed hydraulic pump. The fluid flow rate output of the hydraulic pump is maintained at a substantially constant level by positioning a valve and bypass means between the input and output sides of the hydraulic pump such that when the fluid pressure at the outlet side of the pump exceeds a certain predetermined value, the valve and bypass means opens progressively to allow excess fluid to pass back to the inlet side of the pump.

3,603,106
THERMODYNAMIC CONTAINER

John W. Ryan, 688 Nimes Road, Bel Air, and Wallace H. Shapero, 23139 Anza Avenue, Torrance, both of, Calif.

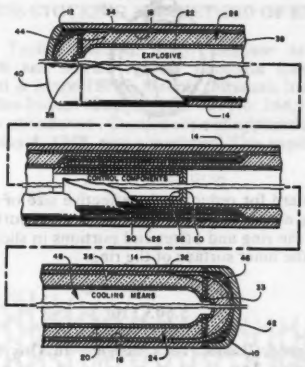
Filed Mar. 27, 1969, Ser. No. 810,957
Int. Cl. F25d *3/08*
U.S. Cl. 62—457 9 Claims

This invention relates to food and beverage containers and more particularly to containers of the thermodynamic type capable of regulating the temperature of the food and beverage therein. The thermodynamic container disclosed herein comprises an outer wall of low thermal conductivity separated by an insulating material from an inner metal capsule of very high thermal conductivity having a heat-storage material disposed therein. Beverages too hot to drink melt the heat-storage material which in turn cools the beverage to a drinkable temperature within two minutes. Heat lost during the beverage's cooling is then returned to the beverage to maintain it at a drinkable temperature as the heat-storage material resolidifies.

3,603,107
TEMPERATURE-CONTROL SYSTEM

Adelbert J. Elliott, Livermore, and Milton O. Jones, Pleasanton, both of, Calif.

Filed Apr. 28, 1970, Ser. No. 32,670
Int. Cl. F25d *3/02*
U.S. Cl. 62—459 9 Claims

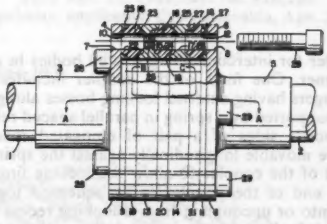


Explosive device temperature controlling wherein high temperature effect of an environment is minimized by isolating explosive and a low temperature medium from the environment by enclosing within apparatus comprising a container including a removable end closure, first and second open-ended double-walled housings each having an outer wall supported by the container and an inner wall spaced from the outer wall with heat-insulating barrier therebetween, the container maintaining the double-walled housings in axial alignment with the open ends thereof in substantially abutting relationship with each other.

3,603,108
RESILIENT COUPLING

William B. Herbert, 111 Yantacaw Brook Rd., Montclair, N.J.

Filed Apr. 20, 1970, Ser. No. 29,905
Int. Cl. F16d *3/78*
U.S. Cl. 64—13 12 Claims

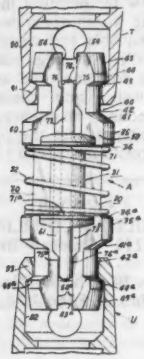


Couplings are provided which are designed primarily to be used between the propeller shaft and the engine shaft of a boat. The coupling embodies rings of rigid and resilient material alternately arranged, with the rings of resilient material maintained under compression by means of screw bolts or cap screws. The coupling insulates the shafts from each other electrically, to eliminate electrolytic action, and, at the same time, absorbs a certain amount of vibration and misalignment. The design, moreover, is such that at no time is the resilient material under tension or stretch, but, rather, any deflection of the coupling about its axis tends to compress the resilient material.

3,603,109
RING WITH RESILIENT RING GUARD AND SECURING SCREW
Valdemar Virtanen, 830 42nd Street, Brooklyn, N.Y.
Filed Aug. 28, 1969, Ser. No. 853,759
Int. Cl. A44c 9/02
U.S. Cl. 63—15.6 4 Claims

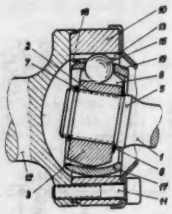
A ring guard for reducing the effective size of a ring, said guard being a strip of plastic having a central portion thereof secured to the ring and offset end portions in sliding engagement with the inner surface of the ring.

3,603,110
WELL TOOLS
John V. Fredd, Dallas, Tex., assignor to Otis Engineering Corp., Dallas, Tex.
Filed Sept. 4, 1969, Ser. No. 855,309
Int. Cl. F16d 3/44
U.S. Cl. 64—16 17 Claims



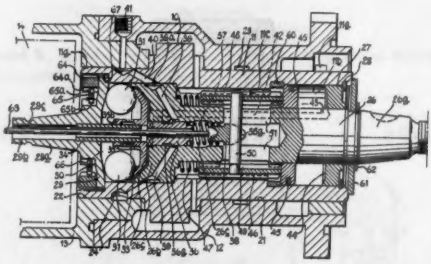
A coupler for interconnecting spaced bodies in an articulated manner. One form of the coupler includes elongate locking fingers having external locking bosses along opposite ends and supported by a spring in parallel spaced relationship along opposite sides of a pair of elongated spacers. The spacers are movable longitudinally against the spring toward either end of the coupler to allow the locking fingers along the other end of the coupler to be squeezed together for coupling into or uncoupling from a locking recess of one of the spaced bodies. Upon release the spring returns the spacers to neutral aligned positions holding the locking finger in parallel noncompressible coupling relationship. Another form of the coupler includes rotatable spaced latch rings around the locking fingers at opposite ends of the spring. The latch rings have internal release recesses and locking flanges and are each rotatable between a first position at which the spacers are released to move longitudinally relative to the ring and locking fingers and a second position at which the spacers are held against longitudinal movement at neutral positions between the locking fingers holding the locking fingers against compression in coupling positions. Both forms of the coupler are useful for interconnecting a plurality of well tools to form an articulated train of tools for movement through a tubing string.

3,603,111
CONSTANT VELOCITY JOINT
Erich Aucktor, and Walter Willimek, both of Offenbach am Main, Germany, assignors to Lohr & Bromkamp GmbH, Offenbach/Main, Germany
Filed Mar. 18, 1970, Ser. No. 20,698
Claims priority, application Germany, Mar. 20, 1969, P 19 14 275.7
Int. Cl. F16d 3/30
U.S. Cl. 64—21 10 Claims



Constant velocity joint includes an inner joint member axially displaceable with respect to a surrounding outer joint member, the outer joint member having an inner surface formed with grooves and the inner joint member having an outer surface formed with grooves, a plurality of balls respectively disposed within corresponding grooves of the inner and outer joint members for transmitting torque therebetween, cage means located between the inner and outer joint members and adapted to retain the plurality of balls in a common plane, the outer surface of the inner joint member at one axial end thereof having a spherical surface portion and at the other axial end thereof having a frustoconical surface portion.

3,603,112
INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES
Giuseppe Sola, Turin, Italy, assignor to FIAT Societa per Azioni, Turin, Italy
Filed Sept. 4, 1969, Ser. No. 855,286
Claims priority, application Italy, Sept. 28, 1968, Aug. 6, 1969, 53303;52906
Int. Cl. F16d 5/00; F02m 39/00
U.S. Cl. 64—25 8 Claims



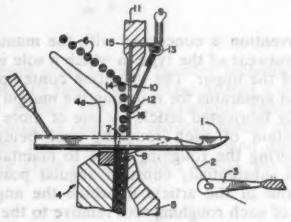
An injection pump for an internal combustion engine, has a casing in which a hollow cam shaft carrying at least one pump-operating cam is rotatably supported. A driving shaft extends within the hollow camshaft, and an axially displaceable coupling sleeve is interposed between the driving shaft and the camshaft. A fluid pressure servocontrol such as an hydraulic annular piston, are housed within said hollow camshaft for controlling axial displacement of the coupling sleeve, the latter having, for example, helicoidal splines, so that displacement of said sleeve axially varies the relative angular position of the camshaft and the driving shaft and thereby the relative timing of the operation of a pumping

member operated by the rotation of the camshaft. To assist reliable operation at low pressures the outer diameter of the annular actuator piston should exceed its inner diameter by at least 65 percent.

3,603,113
METHOD OF KNITTING
Lee D. Gilchrist, P.O. Box 1, Becket, Mass.
Filed Apr. 14, 1969, Ser. No. 816,051
Int. Cl. D04b *1/24*
U.S. Cl. 66—172 13 Claims

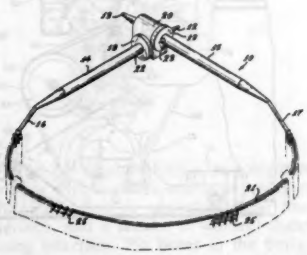
Method of making a tubular knitted article by hand knitting using two straight single-pointed needles is carried out by (1) casting-on the stitches in a circle, (2) knitting the subsequent circular rows of the tubular article by alternately working and slipping stitches, and (3) binding-off the last row in a circle.

3,603,114
WARP-KNITTING MACHINE
Manfred Erich Jaskulski, Kandler; Gerd Heinz Ruger, Karl-Marx-Stadt, and Wolfgang Kurt Wunsch, Karl-Marx-Stadt, all of, Germany, assignors to Veb Nahwirkmaschinenbau Malimo Karl-Marx-Stadt, Karl-Marx-Stadt, Germany
Continuation of application Ser. No. 781,668, Oct. 9, 1968, now abandoned , Continuation of application Ser. No. 534,868, Mar. 16, 1966, now abandoned. This application May 22, 1969, Ser. No. 828,439
Int. Cl. D04b *23/06*
U.S. Cl. 66—85 12 Claims



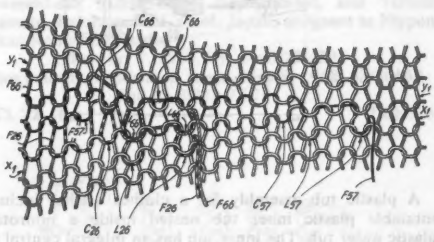
A warp-knitting machine for furnishing a base material with a knitted fabric on both sides thereof in which the base material is supported at one side thereof, a plurality of needles adapted to penetrate reciprocably between selected threads in the base material, the base material on at least one side thereof is supported by additional threads disposed in close proximity to an upper portion of the base material above the penetration of the needles, the additional threads provide a support for the base material by remaining in close proximity thereto under a predetermined tension.

3,603,115
CONNECTOR FOR FLEXIBLE KNITTING NEEDLE
Patricia I. Elzey, 7403 East 3rd, Downey, Calif., and John J. Weidknecht, 8032 Dabury Ln., La Palma, Calif.
Filed Oct. 22, 1969, Ser. No. 868,308
Int. Cl. D04b *35/02*
U.S. Cl. 66—117 2 Claims



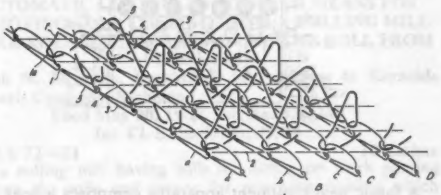
A single connector provided with a pair of transverse openings in which the respective rigid end portions of a flexible knitting needle can be inserted and secured together such that the stitches of an article being knitted and held on a flexible intermediate portion cannot slip off the end portions of the needle. One of the openings in the connector is formed to gage the size of the needle when the end portion is inserted therein and to secure the end portion upon its further insertion therein.

3,603,116
SEAMLESS STOCKING AND METHOD OF KNITTING POCKETS THEREIN
Francesco Turini, Stabbia, Italy, assignor to Lamberto Benvenuti and Enrico Morelli Industria Calza Toscana Benvenuti & Morelli SNC, Stabbia (Firenze), Italy
Continuation-in-part of application Ser. No. 364,178, May 1, 1964, now abandoned , Continuation of application Ser. No. 726,374, May 3, 1968, now abandoned. This application May 11, 1970, Ser. No. 37,390
Int. Cl. D04b *9/56*
U.S. Cl. 66—187 6 Claims



A method of knitting tubular fabric with integral pockets is described. The pockets are formed by partial courses of different length. All complete circular and partial courses are knitted in the same direction. Parts of a circular knitting machine involved in performing the method are described. The method is described in connection with forming heel and/or toe portions of a stocking.

3,603,117
WARP-KNITTED PILE FABRIC
Vladimir Svoboda, and Andrej Vajda, both of Brno, Czechoslovakia, assignors to Elitex, Zavody Textilniko Strojirenstoi, Generalni Reditelsto, Liberec, Czechoslovakia
Filed Apr. 21, 1969, Ser. No. 818,205
Claims priority, application Czechoslovakia, Apr. 22, 1968, PV 2951-68
Int. Cl. D04b *23/08*
U.S. Cl. 66—193 7 Claims



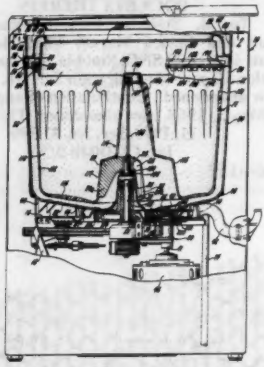
A warp-knitted fabric is made of wales of chain stitches, transverse weft threads, and pile warp threads anchored in successive courses and adjacent wales in the chain stitches to form pile loops between the anchored portions thereof.

3,603,118

PLASTIC TUB ASSEMBLY FOR USE WITH CLOTHES WASHER

Byron L. Brucken, and Ronal H. Whyte, both of Dayton, Ohio, assignors to General Motors Corp., Detroit, Mich.

Filed Apr. 30, 1970, Ser. No. 33,237
Int. Cl. D06f *23/04, 37/14, 37/38*
U.S. Cl. 68—23 8 Claims



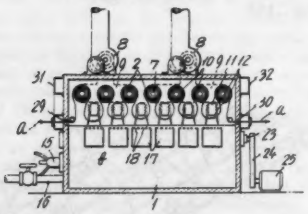
A plastic tub assembly for a clothes washer includes a rotatable plastic inner tub nested inside a nonrotatable plastic outer tub. The inner tub has an integral central agitator and outer scrubbing ribs and is adapted for a driving connection with an oscillation or spinning mechanism. Strengthening the inner tub is provided by a reinforced bottom wall and a metal circumscribing ring, the ring also preventing spin welding of the plastic tubs. The outer tub has an overflow channel at the top and an integral pump housing and antidrip flange at the bottom.

3,603,119

APPARATUS FOR HEAT TREATMENT OF FABRIC

Yikiyoshi Kawaguchi, Kyoto, Japan, assignor to Rabushiki Kaisha Ichikin Rogyosha, Kusatsu-shi, Shiga-ken, Japan

Filed Mar. 10, 1970, Ser. No. 18,192
Claims priority, application Japan, Mar. 13, 1969, 44-18531
Int. Cl. F26b *13/08, 13/20*
U.S. Cl. 68—5 D 10 Claims



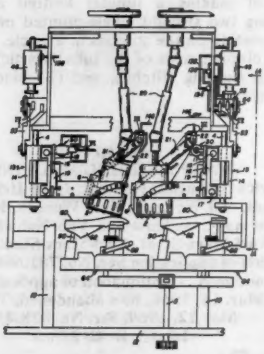
A fabric heat treatment apparatus comprises a heat treatment chamber containing a plurality of suction feed rolls arranged horizontally to support and advance the fabric through the chamber while the fabric hangs in loops between adjacent rolls. Steam drums are positioned both within the loops and therebelow and the drums have outlets facing the loops to project steam thereagainst to lift and heat the fabric as it passes through the heat treatment chamber whereby to relieve the fabric of tension.

3,603,120

APPARATUS FOR ROUGHING THE OVERLASTED PORTIONS OF THE BOTTOMS OF SHOE UPPERS

Waldemar Schilke, Trenton, Ontario, Canada, assignor to Bata Shoe Company of Canada Limited, Batawa, Ontario, Canada

Filed June 2, 1969, Ser. No. 829,345
Claims priority, application Canada, June 3, 1968, 21,617
Int. Cl. C14b *1/44*
U.S. Cl. 69—6.5 7 Claims



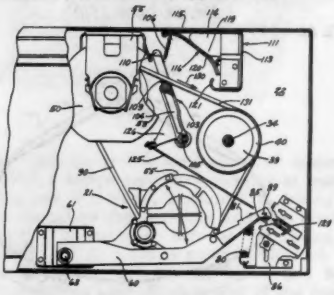
The invention is concerned with the manufacture of articles of footwear of the type in which a sole is bonded to the margin of the upper. The invention contemplates the provision of an apparatus for roughing the margin of the upper of a partially fabricated article by one or more roughing tools. The position of each roughing tool being automatically varied during the roughing cycle to maintain the roughing tool in a substantially constant angular position relative to the bottom of the article in which the angular transverse position of each roughing tool relative to the bottom may be varied during the roughing cycle, and in which the pressure applied to each roughing tool is automatically adjusted during the roughing cycle in accordance with variations in the profile of the bottom. The invention also provides an automatically adjustable last which is always maintained at the right height for proper roughing of the overlasted margin of the bottom.

3,603,121

APPLIANCE DRIVE SYSTEM

Charles W. Burkland, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

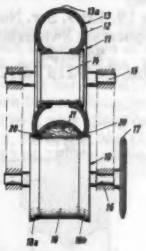
Filed Dec. 18, 1969, Ser. No. 886,183
Int. Cl. D06f *29/02*
U.S. Cl. 68—23.4 14 Claims



A drive system for a fluid extraction portion of a laundry appliance includes a motor and a spinner each having a sub-

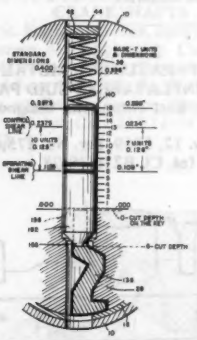
stantially fixed axis of rotation and a pump having an axis of rotation that is pivotable about a fixed axis spaced from the axis of rotation. A belt drivingly connects the motor to the spinner and the pump. The pivoted pump is biased about the pivot axis and effectively operates as an idler in the drive system engageable with the tight side of the belt for substantially no-slip drive of the pump while controlling tension of the belt driving the spinner.

3,603,122
ROLLER DRAINAGE PRESS FOR LAUNDRY
Erich Sulzmann, C.H.6911, Campione TI, Switzerland
Filed Sept. 19, 1969, Ser. No. 859,380
Claims priority, application Germany, Sept. 20, 1968, P 17 85 420.5
Int. Cl. D06f *45/22*
U.S. Cl. 68—264 **2 Claims**



A roller drainage press for wet laundry including a steel drum having conically flared outer edges driving a doughnut-shaped inflated rubber tire. A continuous band of wet laundry is fed through a conically reduced feeder channel to the drum and tire interface. The laundry band distorts the tire to a concave cross section which wrings out absorbed liquid.

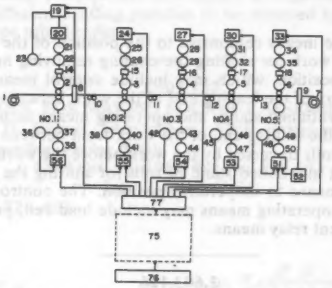
3,603,123
PIN TUMBLER LOCK
Walter E. Best, Indianapolis, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.
Filed Nov. 19, 1968, Ser. No. 776,992
Int. Cl. E05b *27/02*
U.S. Cl. 70—364 **2 Claims**



A key-removable, pin tumbler lock core comprises a core body having a bore with a sleeve and a key plug rotatable therein and defining a first or operating shear line at the plug-sleeve interface, and a second or control shear line at the sleeve-housing interface. Pin bores in the body, sleeve, and plug receive columns of pin segments which cross both shear lines and have key-absent positions which block rotation at both shear lines. When the pin columns are raised by a suitable key, shear faces therein come into alignment with a shear line and thereby permit rotation of the key plug or sleeve.

Standard construction of such lock cores uses pin segment lengths and key-cut positions founded on base-10 increments, i.e. a division by 10, of the distance between the two shear lines, and uses standard dimensions and tolerances corresponding thereto. Such base-10 increment pin division and key cuts limit the number of useable lock combinations. The present invention retains the standard dimensions and tolerances of the lock core structure, but enlarges manyfold the number of available lock combinations by using base-7 increments, i.e. a division by 7, of the shear line separation distance for segmenting the pins and locating the key cuts. The base-7 increment pin segments and keys are fully compatible with existing standard dimensions and manufacturing tolerances and provide full interchangeability between old and new lock cores.

3,603,124
COMPUTER CONTROL SYSTEM FOR ROLLING METAL STRIPS USING FEED-FORWARD AND PREDICTION
Tohru Arimura, Kawasaki-shi; Masamoto Kamata, Kawasaki-shi; Morio Saito, Kawasaki-shi, and Terumi Okamoto, Fukuyama-shi, all of, Japan, assignors to Nippon Kokan Kabushiki Kaisha
Filed May 7, 1969, Ser. No. 822,433
Claims priority, application Japan, May 9, 1968, 43/30562
Int. Cl. B21b *37/12*
U.S. Cl. 72—8 **7 Claims**

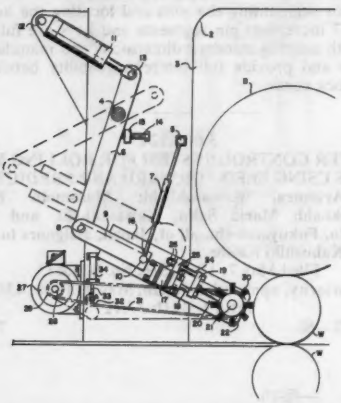


A rolling method wherein the material size may be altered during a normal rolling operation by prediction and feed-forward control comprising predetermining a basic pattern for altering roll peripheral speed corresponding to a fixed pattern of roll opening (or strip gauge), computing the actual amount of alteration of the above speed based on at least a command for gauge alteration and feeding forward the computed value corresponding to roll peripheral speed alteration to each stand.

3,603,125
AUTOMATIC CONTROL SYSTEM FOR MEANS FOR REMOVING ROLL COATING FROM A ROLLING MILL WORK ROLL WITHOUT REMOVING THE ROLL FROM THE MILL
Joseph N. Edwards, Brookfield, Ill., assignor to Reynolds Metals Company, Richmond, Va.
Filed May 20, 1969, Ser. No. 826,240
Int. Cl. B21b *37/08, 27/04*
U.S. Cl. 72—21 **10 Claims**

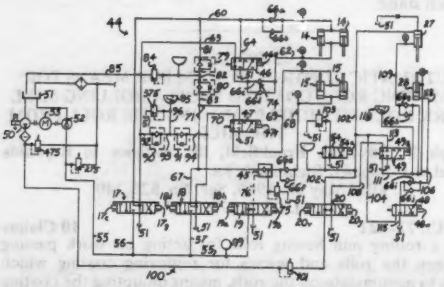
In a rolling mill having rolls for acting on work passing between the rolls and means for removing coating which tends to accumulate on the rolls, means mounting the coating removing means for shifting movement between operative position in contact with a roll and inoperative withdrawn position and means, which may include control means actuated by entry of the leading end of the work between rolls of the mill, responsive to the position of the leading end of the work for shifting the coating removing means to operative position. The structure may include operating means actu-

ated in response to the position of the trailing end of the work for shifting the coating removing means to inoperative position, desirably before the work leaves the roll. The invention may be employed in a rolling mill having in tandem a plurality of stands of rolls for acting on work passing between the rolls of the successive stands, means for removing mounting coating which tends to accumulate on the rolls and means mounting the coating removing means for shifting movement between operative position in contact with a roll of one of the stands of rolls and inoperative withdrawn position, and



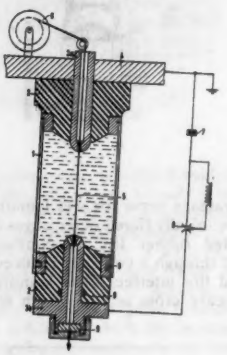
may include means responsive to the position of the leading end of the work for shifting the coating removing means to operative position, which may include control means actuated by entry of the leading end of the work between rolls of the first mentioned stand, and operating means actuated by passage of the trailing end of the work from between rolls of a stand of rolls traversed by the work before the work traverses the first mentioned stand of rolls for shifting the coating removing means to inoperative position. The control means and/or the operating means may include load cell, pressductor or current relay means.

3,603,126
METHOD AND APPARATUS FOR RIVETING WITH TITANIUM ALLOYS
Charles W. Newman, 11653 Southeast 49th, Bellevue, Wash., and H. James Clement, 1042 S. 173rd, Seattle, Wash.
Filed Apr. 24, 1959, Ser. No. 819,033
Int. Cl. B21j *15/02*
U.S. Cl. 72—28 **20 Claims**



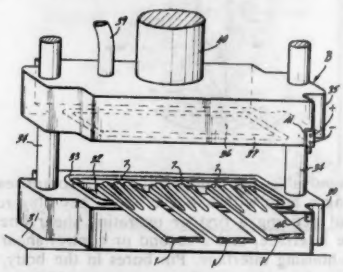
A device for cold forming a titanium alloy rivet according to a precise force vs. time relationship selected to avoid work hardening of the rivet. An electrical control circuit produces a squeeze signal waveform corresponding to the desired force rate variations to be exerted on the rivet. The squeeze signal operates a fluid pressure regulator on a hydraulic pump to control the force exerted on the rivet by opposed hydraulic squeeze cylinders. The electrical control circuit also produces switching signals for operating directional flow control valves in a hydraulic control circuit for moving the squeeze cylinders into and out of engagement with the rivet. Hydraulic clamp cylinders are used to hold the articles being riveted and the electrical control circuit produces signals for controlling the force exerted by the clamp cylinders and for moving the clamp cylinders into and out of engagement with the articles. The hydraulic control circuit associated with the clamp cylinders also includes means for floating the cylinders.

3,603,127
DEVICE FOR FORMING WORKPIECES HYDROELECTRICALLY
Helmut Seiffert, Nurnberg, and Jochen Haeusler, Furth, both of, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany
Filed June 19, 1969, Ser. No. 834,690
Claims priority, application Switzerland, June 24, 1968, 9446/68
Int. Cl. B21d *26/12*
U.S. Cl. 72—56 **7 Claims**



A device for forming workpieces by pressure waves generated in a liquid by an undersurface spark discharge has two electrodes immersed in the liquid. The electrodes are mutually separated so as to define a spark gap. A capacitor battery is connected across the electrodes and an ignitor is suspended between the electrodes. The ignitor is made up of a carrier threaded of nonconductive material surrounded by a sheath of conductive material.

3,603,128
INFLATION APPARATUS FOR METAL STRIP OR PANELS HAVING INFLATABLE FLUID PASSAGEWAYS
Verne L. Middleton, East Alton, Ill., assignor to Olin Corporation
Filed Nov. 12, 1969, Ser. No. 875,636
Int. Cl. B21d *39/08*
U.S. Cl. 72—58 **8 Claims**



An inflation apparatus for inflating metal strips or panels containing inflatable passageways connected to a preformed

opening. The apparatus comprises two opposing plates which have resilient sealing means mounted on each of the opposing faces of the plates. At least one of the plates has a pressure cavity for supplying fluid under pressure to the preformed opening of the metal strip or panel for inflating the passageways therein. The apparatus also includes means for clamping plates about the preformed opening so that the resilient sealing means sealingly engage the metal strip or panel. This engagement results in crimping the preformed opening but does not close it completely. In operation, the plates are clamped about opposing surfaces of the panel or strip at the preformed opening and a suitable fluid under pressure is forced into the pressure cavity and through the preformed opening so as to inflate the passageways.

3,603,129

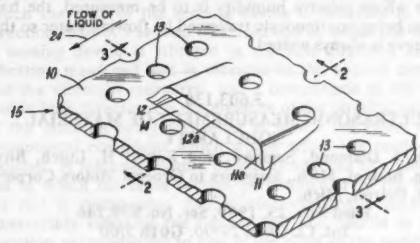
APPARATUS FOR LIQUID-GAS CONTACTING TRAY

Benjamin Williams, Grand Island, and Edward F. Yendall, Kenmore, both of, N.Y., assignors to Union Carbide Corporation

Continuation of application Ser. No. 784,519, Nov. 25, 1968, now abandoned , which is a division of application Ser. No. 547,118, Apr. 1, 1966, now Patent No. 3,417,975, which is a continuation of application Ser. No. 417,264, Dec. 1, 1964, now abandoned , which is a continuation of application Ser. No. 84,807, Jan. 25, 1961, now abandoned. This application Mar. 2, 1970, Ser. No. 18,811

Int. Cl. B21d *28/24, 28/26, 31/02*

U.S. Cl. 72—324 **2 Claims**



A distillation tray formed from a perforated sheet with raised slot openings through which a minor part of the vapor flows with a horizontal thrust component to induce liquid flow and reduce the hydrostatic gradient.

3,603,130

METHOD OF FORGING BLANKS, NOTABLY CRANKSHAFTS

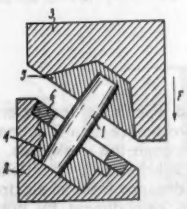
Gabriel Ruget, St. Etienne, France, assignor to Compagnie des Ateliers et Forges de la Loire (St. Chamond, Firminy, St. Etienne, Jacob Holtzer), Paris, France

Filed June 19, 1968, Ser. No. 738,177

Claims priority, application France, June 21, 1967, 111,282

Int. Cl. B21d *11/04*

U.S. Cl. 72—322 **3 Claims**



According to this method, a predetermined angular relationship is maintained between the axis of the piece of metal to be forged and the direction of the effort applied thereto, by exerting against one end of the billet maintained in a movable die a force which is neither parallel nor perpendicular to its axis, said end being guided for translation or rotation or according to any other desired path while the other end is held in a fixed die, whereby two movements, namely an axial movement and a traverse movement, are obtained concurrently for producing the desired plastic deformation.

3,603,131

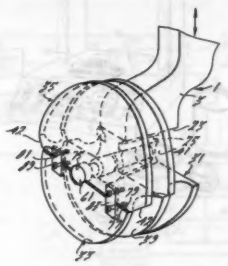
THREE-PUNCH BENDING PRESS

Paul V. Gregg, Racine, Wis., assignor to Tenneco Inc., Houston, Tex.

Filed Apr. 9, 1969, Ser. No. 814,773

Int. Cl. B21d *9/07*

U.S. Cl. 72—389 **5 Claims**



A special punchholder and punch arrangement enables three different bending punches to be attached to a vertical press-type tube bender.

3,603,132

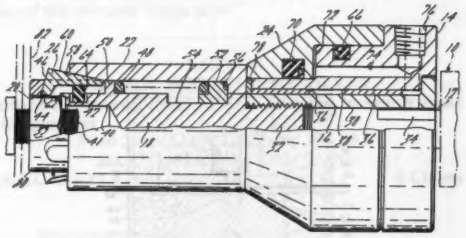
TOOL FOR MAKING LOCKNUT ASSEMBLIES

Horace D. Holmes, Birmingham, Mich., assignor to Masco Corporation, Taylor, Mich.

Filed Oct. 13, 1969, Ser. No. 865,693

Int. Cl. B21d *41/04*

U.S. Cl. 72—402 **11 Claims**



A tool for use with a torque wrench for tightening a nut on a bolt and then crimping the sides of the nut to provide substantially complete engagement of the threads of the nut and bolt to form a locknut assembly.

3,603,133

METHOD FOR CAMERA SHUTTER TIMING

Lawrence A. Westhaver, 13001 Old Stagecoach Road, Laurel, Md.

Filed Oct. 10, 1969, Ser. No. 865,391

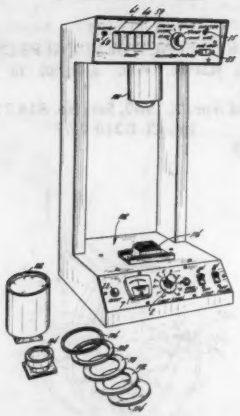
Int. Cl. G03b *43/02;* **G04f** *11/08*

U.S. Cl. 73—5 **9 Claims**

A system for timing photographic shutters, functions related thereto (i.e. sync advance or delay), or any occurrence that can be translated into a pulse of light within the timing range of the system.

The system includes activating the camera shutter so that a pulse of light passes therethrough, sensing the duration of the light as it passes between the half-open and half-closed posi-

tions of the shutter; generating a plurality of electrical clock pulses during the time between half-open and half-closed



positions of the shutter; counting said electrical clock pulses generated; and displaying shutter speed as a function of counted pulses.

3,603,134

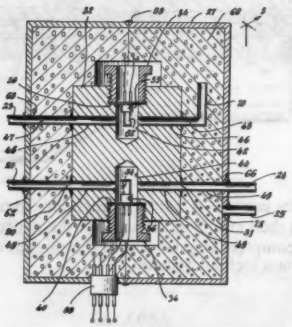
DETECTOR ARRANGEMENTS FOR ANALYTICAL APPARATUS

Stanley D. Norem, Bayside, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of application Ser. No. 645,263, June 12, 1967, now abandoned. This application Mar. 2, 1970, Ser. No. 14,786

Int. Cl. G01n *27/18*

U.S. Cl. 73—27 **9 Claims**



A detector arrangement for use with an analytical instrument includes a cell having a plurality of members which form a detector chamber and a gas-conductive passageway for conveying a sample-carrying gas through the chamber. Sensing means are positioned in a gas flow path in the chamber for sensing the presence of sample constituents in the gas stream. Sealing means are provided for conducting an inert gaseous medium between the chamber and a surrounding atmosphere for reducing gas leakage therebetween.

3,603,135

APPARATUS FOR CONTINUOUS MEASURING OF THE MOISTURE CONTENT IN A HIGH TEMPERATURE CHAMBER AT ATMOSPHERIC PRESSURE

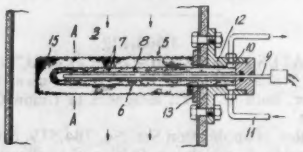
Yukiyoski Kawaguchi, Kyoto, Japan, assignor to Kabushiki Kaisha Ichikin Kogyosha, Kusatsu-shi, Shiga-ken, Japan

Filed Oct. 16, 1969, Ser. No. 866,989

Claims priority, application Japan, Nov. 14, 1968, 43/82845

Int. Cl. G01n *25/62, 25/56*

U.S. Cl. 73—29 **9 Claims**



The wet bulb thermometer of a psychrometer comprises a measuring portion mounted within a permeable sleeve which is high temperature resistant and which has a base portion extending outside the chamber containing the gaseous substance whose relative humidity is to be measured, the base portion being continuously traversed by flowing water so that the sleeve is always wetted.

3,603,136

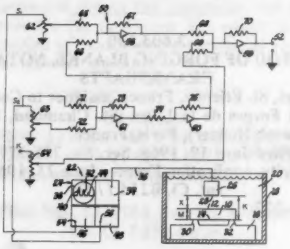
ULTRASONIC MEASUREMENT OF MATERIAL NODULARITY

Milton J. Diamond, Saginaw, and Robert H. Lutch, Birch Run, both of, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1969, Ser. No. 879,746

Int. Cl. G01n *29/00;* **G01h** *5/00*

U.S. Cl. 73—67.8 **4 Claims**



A method and apparatus for determining the percent nodularity of a workpiece as a function of the speed of ultrasonic sound through the workpiece. According to a first embodiment this is achieved by positioning the workpiece at a predetermined distance from an electroacoustic transducer and in a second embodiment by positioning the casting between two electroacoustic transducers which are spaced at a predetermined distance. DC voltage signals relating the time between the generation of the ultrasonic impulses and the detection of back reflection impulses by the electroacoustic transducers are combined by a signal-generating circuit in accordance with an empirical relationship so as to

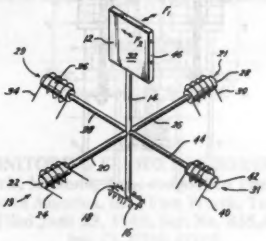
generate a DC voltage output signal proportional to the percent nodularity of the workpiece.

3,603,137

VIBRATING METHOD AND APPARATUS FOR DETERMINING THE PHYSICAL PROPERTIES OF MATERIAL

William B. Banks, Houston, Tex., assignor to Automation Products Inc., Houston, Tex.

Filed Nov. 5, 1968, Ser. No. 773,403
Int. Cl. G01n *9/03, 11/00*
U.S. Cl. 73—32 **18 Claims**



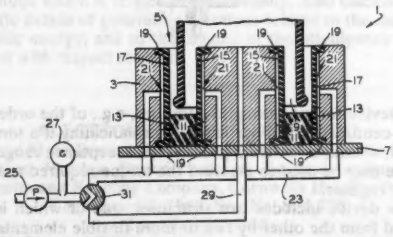
A method and apparatus for determining the physical properties of a material by a vibratory material sensing device in which the area of the sensing device is different in a first direction than in a second direction and in which the material sensing device is vibrated in the first direction and the vibration measured and is vibrated in the second direction and the vibration measured, and a comparison of the vibration in both directions is the measure of the physical property of the material being measured in which the effect of environmental conditions which would affect the readout are reduced. A material sensing paddle connected to a vibratory rod in which the cross section perpendicular to the axis of the rod is rectangular, having electromagnetic means for transversely vibrating the flexible rod and paddle in a first direction perpendicular to one of the sides of the paddle and at its natural resonant frequency of the element and having electromagnetic means for measuring the natural resonant frequency of the flexible rod and paddle in the first direction, and electromagnetic means for transversely vibrating the rod and the paddle in a direction perpendicular to the first direction and at the natural resonant frequency of the rod and paddle in the second direction, and electromagnetic means for measuring the natural resonant frequency of the rod in the second direction whereby a comparison of the measured natural resonant frequencies in the first and second directions eliminate environmental conditions affecting the natural resonant frequency of the rod.

3,603,138

PNEUMATIC TESTER FOR LINEMAN'S GLOVES

Erwin P. Peterson, Box 236, Blue Grass, Iowa

Filed Nov. 21, 1969, Ser. No. 879,003
Int. Cl. G01m *3/26, 3/02*
U.S. Cl. 73—37 **6 Claims**



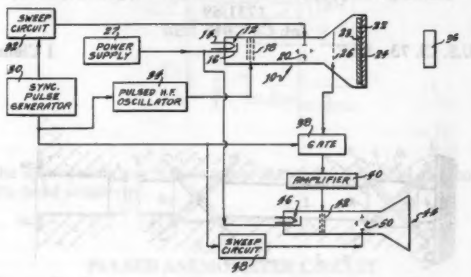
A testing apparatus is provided for lineman's elastic gloves which comprises a closed, U-shaped channel having at least one pneumatic sidewall for engaging the cuff of the glove with the opposite sidewall when it is inflated. The glove can then be inflated, as by air pressure, for inspection as to its porosity.

3,603,139

PULSED ACOUSTIC IMAGE CONVERTER

Shuh-Pan Ying, Ann Arbor, Mich., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed May 13, 1968, Ser. No. 728,686
Int. Cl. G01n *29/00*
U.S. Cl. 73—67.9 **12 Claims**



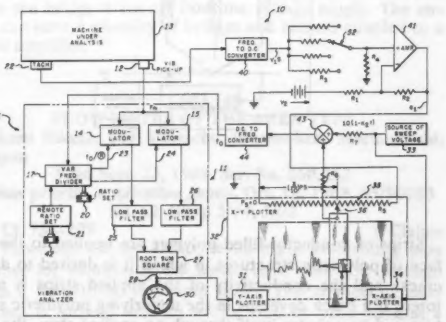
An acoustic image converter comprises an acoustic image tube including a piezoelectric member and an electron gun structure capable of directing an electron beam over a surface of the piezoelectric member. Means provide a pulsed electric field across the piezoelectric member to transmit pulsed ultrasound therefrom to the object, the object reflecting a portion of the transmitted pulsed ultrasound back to the piezoelectric member to create a charge distribution thereon. The electron beam impinging upon the piezoelectric member releases therefrom secondary electrons having energies responsive to the charge distribution on the piezoelectric member. A collector electrode detects the secondary electrons and modulates the intensity of the display of a cathode-ray tube whose sweep is synchronized with the electron beam scan of the acoustic image tube.

3,603,140

GRAPHIC VIBRATION RESOLVER

Richard B. Spencer, Phoenix, Ariz., assignor to Sperry Rand Corporation

Filed Jan. 15, 1969, Ser. No. 791,283
Int. Cl. G01m *7/00;* **G01r** *23/00*
U.S. Cl. 73—71.4 **6 Claims**



A graphic vibration resolver for rotating machinery including a programmable wave analyzer, a graphic X–Y plotter, and control electronics that provides an X–Y plot of vibration amplitude versus the gear ratio between a component of

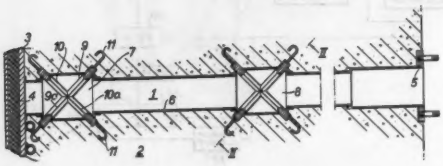
interest and a reference machine speed as measured by, for example, a tachometer (Tach Ratio). The present invention provides that a peak for a particular component of interest always occurs at the same X-axis location on the resulting plot regardless of speed changes of the machine being analyzed.

3,603,141

DEVICES FOR ESTIMATING THE STRESS IN CONCRETE STRUCTURES

Alfred Norman Kinkead, Winfrith, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 29, 1969, Ser. No. 888,306
Claims priority, application Great Britain, Jan. 10, 1969, 1731/69
Int. Cl. G01b 5/30
U.S. Cl. 73—88 E **1 Claim**



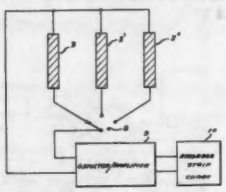
A reinforced-concrete structure is provided with a bore extending into the concrete mass from one face and an annular member, whose deflection in terms of applied stress is known, set in the wall of the bore, the member having a linear dimension measurable from within the bore which is indicative of the deflection.

3,603,142

METHOD OF DETECTING CRACKS AND MEASURING STRAIN IN POLYMERIC STRUCTURES

Donald Saylak, and Arch D. Johnston, both of Lancaster, Calif.

Filed May 7, 1970, Ser. No. 35,412
Int. Cl. G01b 7/18; G01l 1/22
U.S. Cl. 73—88.5 R **5 Claims**



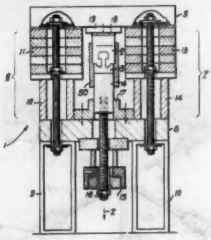
Strips of conductor-filled polymer are applied to the surface of polymeric structures in which it is desired to detect cracks and the conductivity of the applied strips is monitored. If a crack develops in the underlying polymeric structure and propagates itself through an applied strip, the strip will lose its ability to conduct electricity and the crack will be detected. By measuring the resistance of the strips, strain in the polymeric structure can also be determined. The invention is particularly useful in detecting cracks and strain in solid rocket propellant grains.

3,603,143

APPARATUS FOR TESTING THE VANE ANCHORAGE OF TURBINE VANES

Klaus Detert; Hans-Jochen Lipp, and Erich Winschuh, all of Neu-Isenburg, Germany, assignors to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt, Germany

Filed June 26, 1969, Ser. No. 827,537
Claims priority, application Germany, May 25, 1968, P 17 73 500.1
Int. Cl. G01n 3/08, 3/28, 3/24
U.S. Cl. 73—95 **6 Claims**



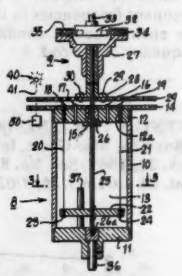
Testing apparatus for determining tightness, deformations and weak points of the vane anchorage of a turbine vane. The apparatus operates by applying forces to a vane, which includes a vane base, attached in the normal fashion to a simulated portion of a turbine rotor. A force in a direction corresponding to the radial direction in a turbine rotor and hence to the direction of centrifugal force in a rotating rotor is applied by attaching the vane and rotor portion to respective first and second yokes separated by resilient elements and drawing the vane and rotor portions apart. A force in a direction corresponding to the axial and/or tangential directions of a turbine rotor and hence the direction of the forces of the driving fluid which act on the vanes during operation of a turbine is applied by an additional device while the vane and rotor portions are held in the yokes.

3,603,144

TORQUE METER

Edward C. Smith, Madison, Conn., assignor to Neptune Meter Company, New York, N.Y.

Filed Sept. 22, 1969, Ser. No. 860,002
Int. Cl. G01l 3/02
U.S. Cl. 73—136 R **3 Claims**



A device for measuring low torques, e.g., of the order of a gram-centimeter, and particularly for indicating if a torque is below, within, or above a preselected acceptance range. The device may be used to measure the torque required to turn a meter register.

The device includes two structures, one of which is supported from the other by two or more flexible elements, e.g., strings. The supporting structure is positively rotated and the supported structure turns with the supporting structure only by torque transmitted through the strings. The supported

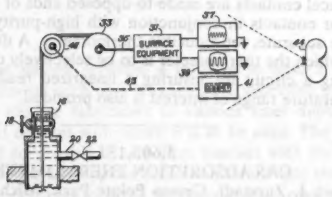
structure is operatively coupled to a rotatable element, such as the shaft of a meter register, which element is subjected to frictional forces. The lag between the supported and the supporting structures is indicative of the frictional force acting on the element.

The lag is measured by means of two Polaroid discs, one affixed to the supporting structure, the other one affixed to the supported structure. A light beam is sent through the two Polaroid discs. A photocell circuit detects the intensity of light passing through for the purpose of giving an indication of the angular displacement between the Polaroid discs. A discriminating circuit determines if the angular displacement, and hence the torque, is below, within, or above a preselected acceptance range, and accordingly actuates suitable indicator lights and/or suitable recorders.

ERRATUM

For Class 73—147 see:
Patent No. 3,602,920

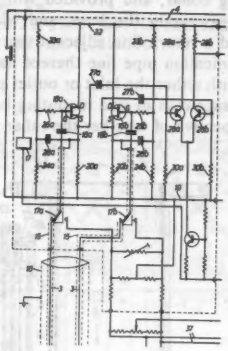
3,603,145
MONITORING FLUIDS IN A BOREHOLE
Billy P. Morris, Midland, Tex., assignor to The Western Company of North America, Inc., Fort Worth, Tex.
Filed June 23, 1969, Ser. No. 835,463
Int. Cl. E21b *47/10*
U.S. Cl. 73—155 **16 Claims**



This specification discloses method and apparatus for monitoring flow and character of fluids in a borehole penetrating subterranean formations, characterized by transmitting acoustic energy through the fluids between transducers in a down-hole tool and discriminating intelligence bits from the acoustic energy arriving at the transducer serving as receiver. A portion of the acoustic energy is transmitted upstream and a portion of the acoustic energy is transmitted downstream. In one embodiment, intermittent acoustic energy is employed and the intelligence bits are, respectively, the travel time downstream and the travel time upstream; affording information as to the difference in the respective travel times which is related to velocity of flow of the fluids and the average travel time which is related to the density of the fluids. In another embodiment, intermittent or continuous acoustic energy is employed and the intelligence bits are, respectively, apparent frequency affording information as to frequency shift which is related to velocity of fluid flow and amplitude which is related to fluid density. Also disclosed are specific details of generating functions related to the received acoustic energy; and to the logging of the intelligence information with respect to depth.

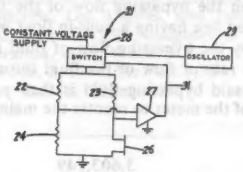
3,603,146
ELECTROMAGNETIC FLOWMETERS
Leonard Myer Bennett, Rodborough, Stroud, and John Edwin Cripps, Horsley, Stroud, both of, England, assignors to Schutte and Koerting Company, Cornwells Heights, Pa.
Filed June 18, 1969, Ser. No. 834,270
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 EM **2 Claims**

An electromagnetic flowmeter comprising a detector head, an amplifier and a calibration circuit unit the characteristics of which are related to the sensitivity of the head in such manner that when the unit is connected to the amplifier in



the appropriate way it operates to match the amplifier gain to the head sensitivity.

3,603,147
PULSED ANEMOMETER CIRCUIT
Frank D. Dorman, St. Paul, Minn., assignor to Thermo-Systems, Inc., St. Paul, Minn.
Filed Nov. 5, 1969, Ser. No. 874,288
Int. Cl. G01p *5/10*
U.S. Cl. 73—204 **18 Claims**

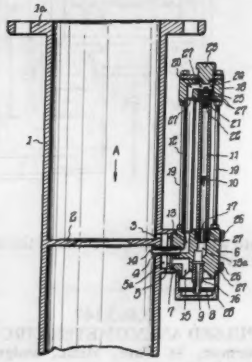


An electronic circuit for operating resistance sensors at a constant temperature to obtain measurements of velocity and direction in fluids. The circuit has a balancing bridge including a sensor and amplifier producing a pulsed output voltage directly proportional to the electrical power input to the sensor and proportional to the heat transfer rate between the sensor and fluid. The output voltage of the amplifier triggers an electronic switch operable to control the voltage supplied to the bridge. One form of the circuit has a dummy load coupled to the switch to take the power supplied to the switch when the bridge is cut off from the voltage supply. The circuit can have a plurality of bridges and sensors coupled to a single amplifier.

3,603,148
FLOW METER OF THE AREA TYPE
Sotakazu Rikuta, 148 Koun-cho, Gunma-ken, Maebashi-shi, Japan
Filed Sept. 23, 1969, Ser. No. 860,232
Claims priority, application Japan, Oct. 18, 1968, 43/90903
Int. Cl. G01p *5/14, 5/02*
U.S. Cl. 73—209 **5 Claims**

A flowmeter of the area-type having a connecting pipe member for connecting the meter to a main line through which a fluid to be measured flows. The connecting pipe member is formed with an orifice disc or plate so that a bypassing flow of the fluid is produced by a pressure differential in the fluid flow between the upstream side and the downstream side of the orifice, which flow takes place by way of bypassing inlet and outlet ports provided respectively on the upstream and downstream sides of said orifice and

within a meter-mounting collar formed on the connecting pipe. The inlet and outlet ports are operatively connected with a flowmeter having a mounting base cooperable with sad mounting collar, and provided with separate feed and return passageways in the base, and with a feed-receiving float line and a return line adjacent thereto, so that a common communication pipe line thereof has one end which is connected with either the inlet or outlet passageway, and the separate passageways in said mounting base are so disposed so that irrespective of whether the other end of the commu-



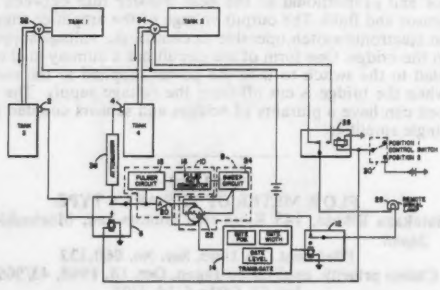
nication-connecting pipe is connectably inserted within either of said inlet or outlet port of said connecting pipe member then the bypassing flow of the fluid is introduced into a tapered line having a built-in float which is adapted to be moved by the bypassing flow of fluid into a position indicating the rate of flow of the fluid through the main line, whereupon said bypassing fluid is then passed through the return line of the meter to reenter the main line.

3,603,149

ULTRASONIC LIQUID LEVEL INDICATOR

Ross D. McKown, Woodland Hills, Calif., assignor to the United States of America as represented by the Secretary of the Army.

Filed Sept. 3, 1969, Ser. No. 854,843
Int. Cl. G01f *23/28*
U.S. Cl. 73—290 V **2 Claims**



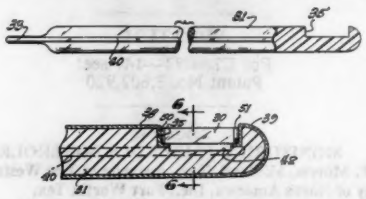
A transducer is placed on the outside of a container and used to transmit an ultrasonic pulse through the wall of the container and to detect the reflected ultrasonic pulse. The amplitude reflected pulse is dependent upon the specific acoustic impedance of the container. The specific acoustic impedance of the container is related to the substance in contact with the wall of the container beneath the transducer. By detecting a change in specific acoustic impedance it is possible to determine when the container has been filled to a predetermined level. A cathode-ray tube provides a visual indication of the specific acoustic impedance. A gated output is provided to automatically control the filling process of the container.

3,603,150

DISPOSABLE BODY TEMPERATURE SENSOR

Stephen L. Kurtin, 536 S. Euclid Ave., Pasadena, Calif., and Carver A. Mead, 2036 Pasadena Glen Road, Pasadena, Calif.

Filed Nov. 19, 1969, Ser. No. 878,001
Int. Cl. G01k *7/22*
U.S. Cl. 73—362 SC **7 Claims**



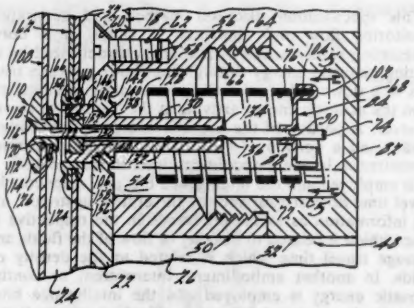
A medically accurate disposable body temperature sensor employing a bar of high-purity crystalline germanium. The germanium bar is disposed within a plastic rod and ambipolar electrical contacts are made to opposed ends of the bar. Ambipolar contacts in conjunction with high-purity germanium assure accurate, reproducible thermometry. A digital readout into which the thermometer is to be selectively connected including a circuit for insuring a linearized reading over the temperature range of interest is also provided.

3,603,151

GAS ADSORPTION THERMOMETER

Herbert J. Zurstadt, Grosse Pointe Park, Mich., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed June 16, 1969, Ser. No. 833,306
Int. Cl. G01k *5/36*
U.S. Cl. 73—368.6 **12 Claims**



A gas adsorbent thermometer comprising an external housing; a temperature indicating member; means defining a chamber interiorly of the housing; a shaft member having one end thereof supporting the indicator member for rotational movement relative to the housing and the opposite end thereof disposed within the chamber; a multiconvolution helical Bourdon tube disposed within the chamber and arranged coaXially of the shaft; the chamber being provided with a quantity of fluid for dampening movement of the Bourdon tube relative to the housing; bearing means for rotatably supporting the shaft and constructed such that the fluid within the chamber will not leak therefrom regardless of the relative orientation of the housing; a takeoff member extending between the Bourdon tube and the shaft and adapted to impart rotary movement to the shaft in response to wind-

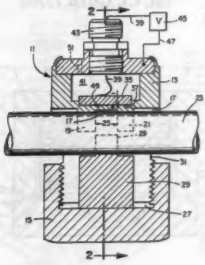
ing and unwinding movement of the Bourdon tube; a temperature sensing bulb containing a mass of gas adsorbent material, and a capillary tube communicating the bulb with the Bourdon tube.

3,603,152

TRANSDUCER FOR DETECTING PRESSURE CHANGES IN FLUID FLOW

Vernon F. Alibert, Chester Heights, and Thomas H. Carey, Chester, both of, Pa., assignors to Columbia Research Laboratories, Inc., Woodlyn, Pa.

Filed Feb. 5, 1970, Ser. No. 8,821
Int. Cl. G01l *9/08*
U.S. Cl. 73—398 R 7 Claims



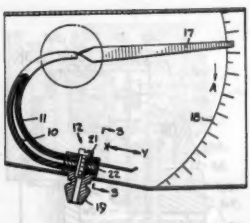
The present device provides a housing to hold a strain responsive element such as a piezoelectric waferlike crystal. The housing can be fabricated to various sizes depending upon the fluid conduit with which it is to be used. The housing is formed to provide a very firm contact with the fluid conduit and hence any applied force or strain which the conduit experiences serves to stress the piezoelectric crystal. Accordingly, the piezoelectric crystal is very sensitive to any changes of pressure of the fluid within said conduit.

3,603,153

DIRECT-ACTING PRESSURE AND VACUUM SENSOR

Siegfried H. A. Schmaus, 806 Powder Mill Lane, Penfield Downs, Philadelphia, Pa.

Filed Jan. 2, 1970, Ser. No. 317
Int. Cl. G01l *7/04*
U.S. Cl. 73—418 5 Claims



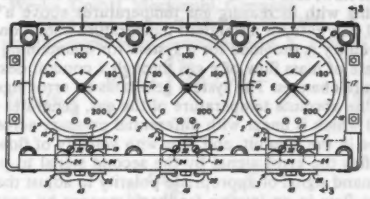
A direct-acting pressure and vacuum sensor operable in the low-pressure range and constituted by two cantilever springs having different lengths and spring rates. The two springs have a similar C-formation and are maintained one within the other, in spaced relation, both springs have being attached at one end to a socket. The free ends of the springs terminate in a cap from which a pointer is extended. The springs are sealed within a flexible envelope to define an internal chamber communicating with the socket, whereby pressure applied thereto causes the springs to deflect, thereby moving the pointer to indicate pressure.

3,603,154

PRESSURE GAUGE ASSEMBLY

Virgil L. Frantz, Salem, Va., assignor to Graham-White Sales Corporation, Salem, Va.

Filed Oct. 21, 1969, Ser. No. 868,131
Int. Cl. G01l *7/00*
U.S. Cl. 73—420 10 Claims



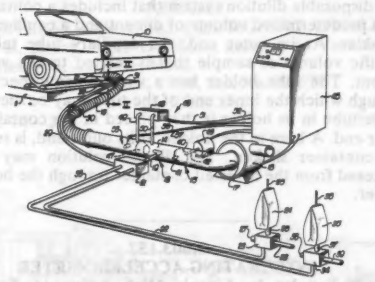
A pressure gauge assembly combining a pressure gauge for gauging one or more pressure lines and a mounting bracket to which the gauge is releasably clamped under spring pressure and locked against release except when relieved of line pressure. The gauge is both connectable to any pressure lines and testable through the bracket and fluid-connected thereto without pipe fittings, and the gauge case has a removable magnifying face plate formed of a glass lens molded in a plastic rim.

3,603,155

METHOD AND APPARATUS FOR MASS EMISSION SAMPLING OF MOTOR VEHICLE EXHAUST GASES

Charles William Morris, Los Angeles, and John Raymond Ulyate, Torrance, both of, Calif., assignors to Chromalloy American Corporation, West Wyack, N.Y.

Filed Feb. 2, 1970, Ser. No. 7,734
Int. Cl. G01n *1/22*
U.S. Cl. 73—421.5 R 22 Claims



An air blower draws a mixture of exhaust gases emitted from an internal combustion engine and ambient air through a through-flow duct having a valve means therein at a minimum volumetric flow rate for the mixture in excess of the maximum volumetric flow rate the engine is capable of emitting while a proportional sample of said total mixture is withdrawn into a sample container at a uniform volumetric rate during a test period, the sample thereafter being analyzed to determine the concentration of pollutants of gas constituents therein and compared with the concentration of such pollutants or gas constituents in the ambient air which is sampled concurrently at the same flow rate from an area adjacent that where the ambient air is drawn into the through-flow conduit, total mass or weight of such pollutants or constituents being calculable from the concentration thereof in said sample and the known total mass or weight of air and gas mixture drawn through the duct.

Temperature sensing and transducer means produce a first or error signal which is a function of the temperature of gases

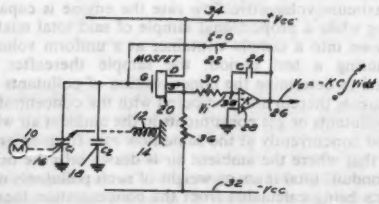
flowing through said duct, volumetric flow rate sensing means and associated transducer means produce a second signal which is a function of volumetric gas flow through the duct and electrical circuit means are provided in association therewith to cause said second signal to modify said first signal to produce a control signal which causes operation of a servomotor to adjust the valve means until an actual required volumetric flow rate through the duct is attained for any given temperature thereof to maintain a constant mass or weight flow, said actual volumetric flow rate for said gases increasing with increasing gas temperatures above a standard initial flow rate for a standard temperature condition.

Circuitry is provided for a system for maintaining constant the rate of mass flow of a gas through a conduit despite temperature changes. The system generates an error signal linear with the absolute temperature of the gas, generates a second signal which is linear with differential pressure across a fixed orifice in the conduit, and thus with velocity of flow therein, modifies the error signal by the second signal to produce a command signal of appropriate polarity to adjust the velocity of gas flow in an inverse feedback manner by controlling a throttling valve in the conduit.

3,603,156
DISPOSABLE DILUTION SYSTEM
Timothy Konkol, Westchester, N.Y., assignor to Gradko Glass Laboratories, Inc., Yonkers, N.Y.
Filed Feb. 4, 1970, Ser. No. 8,604
Int. Cl. G01n *1/10*
U.S. Cl. 73—425.4 **15 Claims**

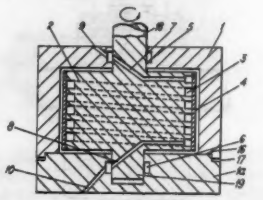
A disposable dilution system that includes a container having a predetermined volume of diluent and a capillary tube in a holder. At its outer end, the capillary tube takes up a specific volume of sample that is related to the volume of diluent. The tube holder has a window or inspection port through which the inner end of the tube may be viewed. The entire tube in its holder is then placed in the container at its outer end. A bore in the holder, at its outer end, is sealed and the container shaken. The diluted solution may then be squeezed from the inverted container through the bore in the holder.

3,603,157
INTEGRATING ACCELEROMETER
Allen D. Krugler, Jr., Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jan. 13, 1970, Ser. No. 2,602
Int. Cl. G01p *15/08*
U.S. Cl. 73—503 **4 Claims**



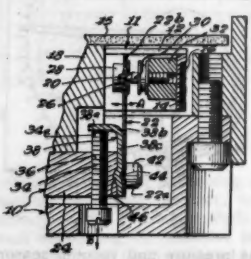
An electronic circuit for developing a voltage signal that is proportional in magnitude to the acceleration of a moving body including an integrator circuit having an input signal equal to the sink voltage of a field-effect transistor with an insulated gate, the gate voltage for the transistor being supplied by a variable capacitance circuit, and a mass-spring system for varying the capacitance thereby causing a gate voltage on said transistor that is related in magnitude to the inertia forces acting on the mass of the mass-spring system.

3,603,158
ANGULAR ACCELERATION SENSOR
Erwin Schlitz, Heusenstamm, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Apr. 16, 1969, Ser. No. 816,740
Claims priority, application Germany, Apr. 22, 1968, P 17 55 285.1
Int. Cl. G01p *15/02*
U.S. Cl. 73—515 **1 Claim**



An angular acceleration sensor of the fluid inertia type is shown. A rotor enclosed in a housing has a fluid filled circumferential spiral groove or canal of one or more turns, in which the fluid is constrained except at the ends of the canal where it may be applied to a differential pressure detector to obtain an analog of angular acceleration applied to the rotor shaft. Two ways are shown, for connecting the canal ends (which rotate themselves) to fixed outside connections through the housing by utilizing the rotor shaft collector ring grooves and ducts or divided clearance spaces between rotor and housing cavity.

3,603,159
PRELOAD ADJUSTMENT MEANS FOR A TRANSDUCER
Jack A. Morrow, Bellevue, Wash., assignor to United Control Corporation
Filed Sept. 8, 1969, Ser. No. 855,839
Int. Cl. G01p *15/08*
U.S. Cl. 73—517 **12 Claims**



A preload adjustment means for the seismic element of a pendulous accelerometer in which the seismic element is rotatably mounted on the free end of a cantilevered leaf spring. An adjustment screw is mounted through a bore in the support structure for movement in a direction parallel to the leaf spring. An L-shaped spring link between the screw and the leaf spring transmits movement of the screw to the spring link and the leaf spring to adjust the pressure exerted

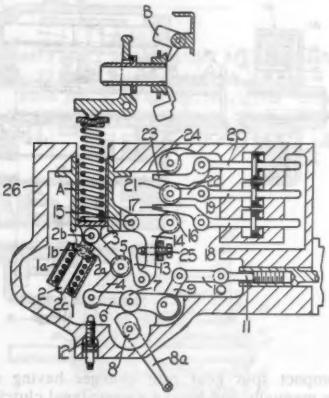
on the seismic element. The coefficients of expansion of the springs and the screw are matched to temperature compensate the preload adjustment means.

3,603,160

SPEED CONTROL FOR GAS TURBINE ENGINES

Joseph Lewis Bloom, Baie D'Urfe, Quebec, Canada, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 27, 1968, Ser. No. 779,346
Int. Cl. G01p *3/16*
U.S. Cl. 73—541 4 Claims



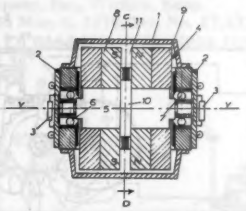
A governor mechanism for controlling the speed of a gas turbine engine comprising a spring means arranged to control the resistance to movement of governor elements, a plurality of pistons independently actuable to control the spring force through lever mechanisms, the pistons being connected by cams and followers, whereby they can be operated independently or in combination.

3,603,161

GYROSCOPE WITH COLLECTORLESS DC MOTOR

Karlhans Schwarz, Germany, assignor to Bodenseewerk Geratetechnik GmbH, Uberlingen, Bodensee, Germany

Filed Sept. 4, 1969, Ser. No. 855,145
Int. Cl. G01c *19/28*
U.S. Cl. 74—5.6 9 Claims



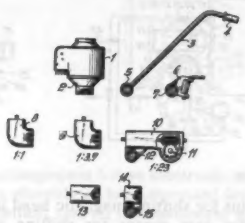
The direct current gyromotor comprises a frame, a rotor rotatably mounted on the frame and a pair of relatively flat stator windings without cores. The rotor has a pair of spaced permanent magnets in cylindrical form and magnetized so that they each have pairs of north and south magnetic poles about their periphery. The two magnets are spaced from each other and positioned so that a north pole of one magnet is opposite a south pole of the other magnet. The stator coils are in the annular space between the magnets. The position of rotation of the rotor is detected by a phototransistor which reads a sequential series of light and dark areas on the rotor. The phototransistor is a part of a flip-flop which controls the conduction of four transistors in a bridge. The stator windings are connected across one diagonal of the bridge with the DC supply being connected across the other diagonal.

3,603,162

MOTOR-DRIVEN SINGLE AXLE AGRICULTURAL MACHINE

Otto Gohler, Mockmuhl, Wurttemberg, Germany, assignor to Agria-Werke, GmbH, Mockmuhl, Germany

Filed Sept. 2, 1969, Ser. No. 854,490
Claims priority, application Germany, Sept. 5, 1968, G 67 50 591
Int. Cl. F16h *57/02*
U.S. Cl. 74—16 9 Claims



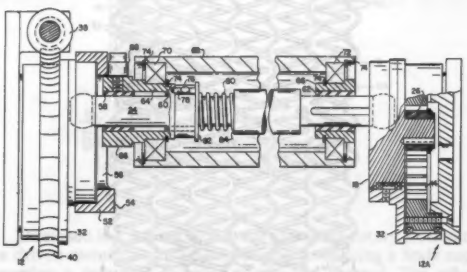
A motor-driven single axle machine for use in agriculture, horticulture, forrestry and for like purposes, the frame of which comprises a worm gear casing having identical gear coupling and casing connection means at each end and being guided and/or pushed by a user and capable of composing the machine frame for different uses from a kit of coordinated gear casings of different shapes and gear equipment. The user is thus able to combine from these gear casings more than one particular machine and thus to undertake a number of different tasks by assembling different machines, adapted to those tasks, from the kit of gear casings.

3,603,163

TRANSVERSE AND AXIAL POSITIONING APPARATUS

Robert R. Henry, Andover, Mass., assignor to Yorkshire Industries, Inc., Andover, Mass.

Filed Apr. 28, 1970, Ser. No. 32,571
Int. Cl. F16h *37/16*
U.S. Cl. 74—22 11 Claims



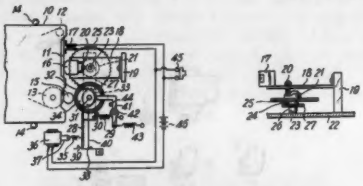
Apparatus comprising a carrier coaxially and rotatably mounted on a stationary internal gear, a mounting member eccentrically and rotatably mounted in said carrier, a pinion nonrotatably and coaxially connected to said mounting member in driving engagement with said internal gear, a shaft nonrotatably connecting to said mounting member, an annular cam face on said carrier coaxially of said mounting member and facing said shaft, a slideable member axially movably and nonrotatably connected to said shaft, a cam fol-

lower fixedly connected to said slideable member and extending into engagement with said cam face, and a biasing member biasing said slideable member and said cam follower toward said cam face.

3,603,164
APPARATUS FOR SHIFTING MAGNETIC HEAD IN MULTITRACK TAPE PLAYER

Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo, Japan

Filed Feb. 3, 1970, Ser. No. 8,168
Int. Cl. F16h *25/08, 25/12*; G11b *5/00*
U.S. Cl. 74—54 **8 Claims**

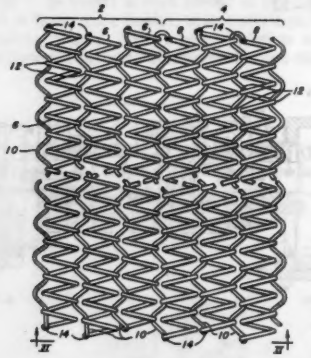


An apparatus for shifting magnetic head in multitrack tape player includes cam means for shifting a magnetic head across the width of the tape to positions corresponding to record-tracks on the tape, and driving means for rotatably driving said cam means at a predetermined angle. Said driving means comprises a frictional wheel rotatably driven by a capstan for drivingly feeding the tape, and means for decelerating rotation of the frictional wheel and imparting the same to said cam means. The frictional wheel is adapted to be prevented from its rotating due to less power transmission from the capstan when the frictional wheel rotate round its axis.

3,603,165
BELT FABRIC FOR PLASTIC-PAD-MOLDING CONVEYOR

Joseph J. Feld, Northridge, Calif., assignor to United States Steel Corporation

Filed July 7, 1969, Ser. No. 839,586
Int. Cl. F16g *1/18*
U.S. Cl. 74—239 **1 Claim**

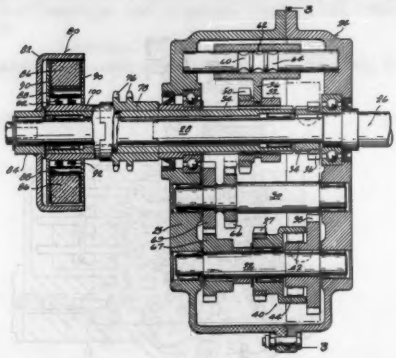


Belt fabric is made up of alternate groups of spiral elements having equispaced vertices. The spiral elements of each group are wound in a direction opposite to the winding of the spiral elements in the groups adjacent thereto. Each pair of adjacent spiral elements are joined together by a crimped connecting wire extending therethrough and engaging nonconsecutive vertices of the pair of adjacent spiral elements. The ends of each connecting wire are rigidly connected with opposite ends of one of the pair of adjacent spiral elements it joins together.

3,603,166
SEMIAUTOMATIC TRANSMISSION

Maurice O. Holtan, 2012 Menomonee Pkwy, Wauwatosa, Wis.

Filed May 15, 1969, Ser. No. 825,009
Int. Cl. F16h *3/08*
U.S. Cl. 74—331 **8 Claims**

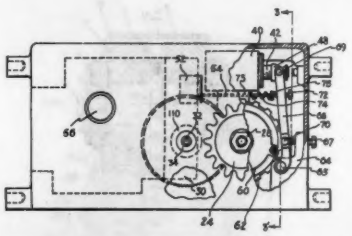


A compact spur gear rate changer having some gears shiftable manually and having a centrifugal clutch for effecting rate changes otherwise, is preferably used to supplement rate changes effected by torque and speed changes to which a belt drive rate changer of the split pulley type is subject. Particularly when the power source is a two cycle engine, a relatively high-speed engine operation is required to develop maximum power. By using the semiautomatic gear transmission to supplement rate changes developed by the split pulley and belt, the engine is enabled to develop full power almost immediately and greatly improved acceleration is noted.

3,603,167
CONTROL DEVICE

Henry L. Arce, Huntington Park, Calif., assignor to Ametek, Inc., New York, N.Y. Continuation of Ser. No. 808,529, Mar. 24, 1969, abandoned

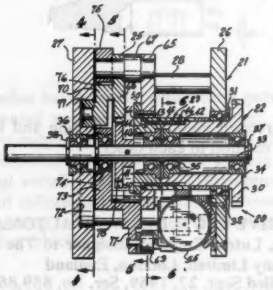
Filed June 11, 1970, Ser. No. 48,847
Int. Cl. F16h *35/00*; B63h *25/14*
U.S. Cl. 74—388 **9 Claims**



A gear train mechanism with a motor input, a planetary clutch and an output shaft with load responsive clutch disengagement means is provided by a toothed outer casing on the planetary clutch with a detent to engage the teeth mounted on a pivotable arm. The arm is retained in the clutch engaging position by a solenoid. The solenoid core is mechanically linked to the arm through a resilient linkage. The solenoid is connected to a suitable e.m.f. with a normally open microswitch which is held in the closed position by a second detent on the arm. Excessive loading overcomes the resilient

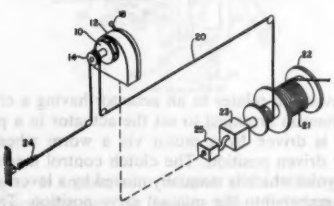
linkage between the core and the arm, permitting the arm and its clutch detent to rock from engagement with the toothed clutch casing. This displacement opens the microswitch, deactivating the solenoid and releasing the planetary clutch. The mechanism is particularly useful for any automatic control function where it is desired to have manual override provision which will disengage the automatic control. It is particularly useful in the linkage between the rudder and the power unit of an automatic pilot. Another application would be in the mechanical linkage between a valve actuation motor and a valve for remotely controlled valves such as underwater valves.

3,603,168
INTERMITTENT MOVEMENT MECHANISM
Joseph Kaplan, 39 Fair Lane, Jericho, N.Y.
Filed Jan. 9, 1970, Ser. No. 1,766
Int. Cl. F16h *35/02;* **F16d** *27/00;* **F16h** *19/00*
U.S. Cl. 74—394 **9 Claims**



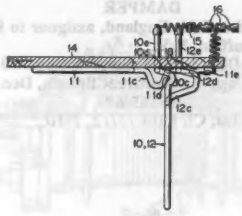
A rotary input having a fixed displacement and an output train of planetary gearing including a rotary carrier driven by the input, planetary gearing and an output gear meshing with the planetary gearing, and cam means controlling rotation of the planetary gearing relative to its carrier.

3,603,169
POSITION CONTROL DEVICE
Matthew R. Fandetti, Brunswick, Maine, assignor to Pine Tree Engineering, Brunswick, Maine and Cardwell Manufacturing Company, Inc., Wichita, Kans.
Filed Mar. 6, 1970, Ser. No. 17,133
Int. Cl. B66d *1/56, 1/50;* **H01h** *3/16*
U.S. Cl. 74—501.5 **6 Claims**



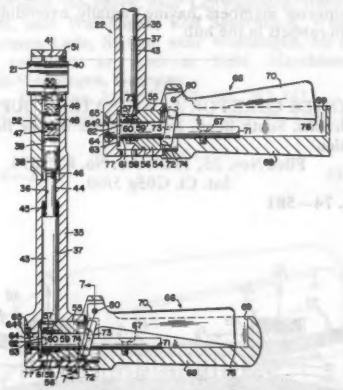
An automatic linear or angular position control device for regulating the position of a given point in one plane, through a selected range, by the means of pulleys, springs, cams and switches. This type of device is used to activate various types of force developing equipments to move the given point as commanded by the position control.

3,603,170
KNEE-LEVER DEVICE OR ARRANGEMENT FOR ELECTRONIC MUSICAL INSTRUMENTS
Takao Yamauchi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan
Filed Feb. 13, 1970, Ser. No. 11,149
Claims priority, application Japan, Feb. 18, 1969, 44/13428
Int. Cl. G05g *1/20*
U.S. Cl. 74—515 **7 Claims**



A knee-lever arrangement for an electronic musical instrument comprises a plurality of knee-operated levers which, in a nonoperable position, rest on the instrument so as not to be obstructive to the player, and which can be simultaneously operated to control various sound effects, in an operable position in which they may be selectively set ready to operate.

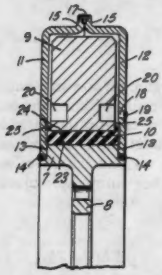
3,603,171
CRANK
Harry G. Dodge, Painesville, Ohio, assignor to Crawford Fitting Company, Solon, Ohio
Filed Nov. 12, 1968, Ser. No. 775,021
Int. Cl. G05g *1/00*
U.S. Cl. 74—548 **15 Claims**



Disclosed is a driving device for imparting rotary motion to a driven member, said driving device comprising a body supporting a rotatable cylinder at one end thereof. The other end of the body includes a rotatable handle extending from the body along an axis parallel to the axis of the rotatable cylinder. An internal passageway is provided in the body in which a reciprocable pin member is disposed. The end of the pin member adjacent the rotatable cylinder is provided with teeth adapted to enter recesses defined in the external surface of the cylinder so as to lock the cylinder against rotation relative to the body when the pin is in a first position. A camming piston is reciprocably supported in the body adjacent the handle. The axis of the camming piston is parallel to the axis of the handle. A pivotal lever is carried by the

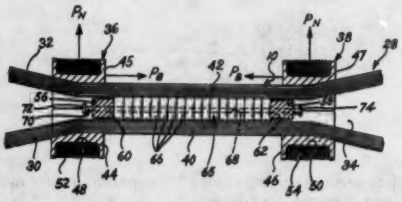
handle and is provided with a cam ring adapted to abut the camming piston. Pivotal movement of the lever produces reciprocable movement of the camming piston which abuts the reciprocable pin to produce movement of the pin thereby locking the cylinder against rotation relative to the body. Spring means are provided in the linkage normally to bias the teeth out of engagement with the recesses so that the cylinder is normally rotatable in the absence of actuation of the handle lever.

3,603,172
DAMPER
Jeffrey Hall, Huddersfield, England, assignor to Houdaille Industries, Inc., Buffalo, N.Y.
Filed Dec. 3, 1968, Ser. No. 780,779
Claims priority, application Great Britain, Dec. 12, 1967, 56365/67
Int. Cl. F16f *15/12, 7/10*
U.S. Cl. 74—574 **16 Claims**



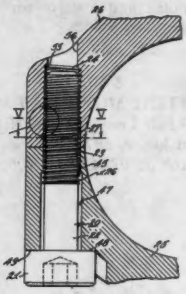
A torsional vibration damper has several important features, including an elastic spacer element which may provide tuning for the damper, which may serve as sealing means for the damper and which may provide spacing means between the inertia member and the housing. The damper housing may comprise members having radially extending portions seated in rabbets in the hub.

3,603,173
CENTER CORE FOR A LAMINATED COUPLING
Peter Brooks, South Bend, Ind., assignor to The Bendix Corporation
Filed Nov. 25, 1969, Ser. No. 879,674
Int. Cl. G05g *5/00*
U.S. Cl. 74—581 **8 Claims**



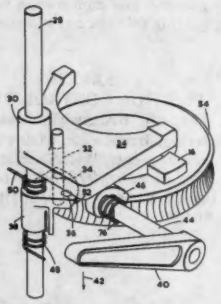
A laminated coupling used to connect a helicopter rotor arm to a rotor blade includes a pair of spaced end bushings interconnected by an endless belt. A pair of annular clips encircle the belt adjacent the bushings to define a center section of the coupling having generally parallel sides defining an opening between them. A core piece composed of a plurality of relatively rotatable laminations is disposed in the opening between the clips to maintain separation of the clips and to permit twisting of the coupling about an axis extending through the bushings.

3,603,174
CAP SCREW WITH PILOTING SURFACE
Paul J. Patchen, Chicago, and Frank C. Kula, Markham, both of, Ill., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Jan. 12, 1970, Ser. No. 2,057
Int. Cl. G05g *1/12*
U.S. Cl. 74—594 **10 Claims**



A screw-threaded member for piloting and fastening two parts in fixed relation to each other.

3,603,175
PLURAL DRIVE CLUTCHES WITH AUTOMATIC LOCK
Peter Horton, Luton, England, assignor to The English Electric Company Limited, London, England
Filed Sept. 22, 1969, Ser. No. 859,863
Claims priority, application Great Britain, Sept. 20, 1968, 44725/68
Int. Cl. F16d *21/04*
U.S. Cl. 74—625 **5 Claims**

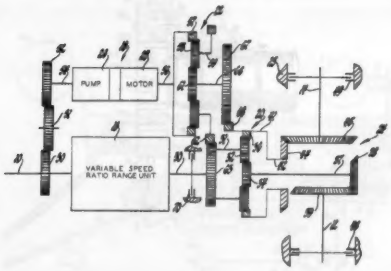


This invention relates to an actuator having a clutch control mechanism arranged to set the actuator in a position in which it is driven by a motor via a worm wheel or in a manually driven position. The clutch control mechanism includes a yoke which is manually moved by a lever to urge the clutch member into the manual drive position. The yoke is locked in this position by a latch which bears against a rod attached to the yoke. In this position the latch also bears against the worm wheel and is rotated when the latter is motor-driven. Rotation of the latch allows the rod to drop into a hole in the latch and the clutch member moves into engagement with the worm wheel. Rotation of the worm wheel therefore automatically changes the actuator from manual drive to motor drive.

3,603,176
TRANSMISSION

Roderick G. Tipping, and William V. Phillips, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 10, 1969, Ser. No. 865,240
Int. Cl. F16h *47/04, 37/06*
U.S. Cl. 74—687 4 Claims

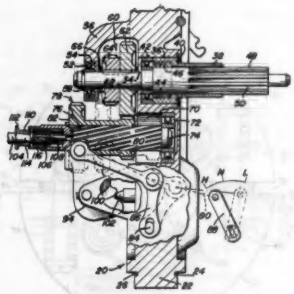


A transmission having speed differential gearing driven by an input powered variable speed ratio range unit to effect driving of two outputs at the same speed for straight vehicle drive and additional speed differential gearing driven by an input-powered variable speed ratio hydrostatic drive unit to effect a speed differential bias on the first-mentioned speed differential gearing to effect a speed differential between the two outputs for vehicle steering.

3,603,177
VARIABLE DRIVE RATIO ENGINE TO TRANSMISSION ADAPTER

Robert C. Burrows, P.O. Box 783, Truckee, Calif.

Filed Sept. 23, 1969, Ser. No. 860,310
Int. Cl. F16h *5/06, 3/22*
U.S. Cl. 74—745 17 Claims

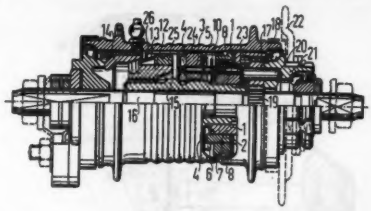


An engine to transmission adapter plate with integral two speed transmission gearing for disposition between an engine block and an associated transmission housing. The adapter plate not only includes two speed transmission gearing, but also serves to couple an engine output shaft to an associated transmission input or clutch shaft with the engine output shaft upwardly displaced relative to the transmission shaft center axis with which it is customarily coaxial, thereby increasing engine-to-ground clearance of the associated vehicle.

3,603,178
MULTIPLE-SPEED BICYCLE HUB WITH CENTRIFUGAL GOVERNOR

Manfred Lutz, and Horst Schulz, both of Schweinfurt am Main, Germany, assignors to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed Nov. 12, 1969, Ser. No. 875,834
Claims priority, application Germany, Nov. 15, 1968, P 18 09 140.2
Int. Cl. F16h *5/46;* F16d *43/04*
U.S. Cl. 74—752 E 11 Claims

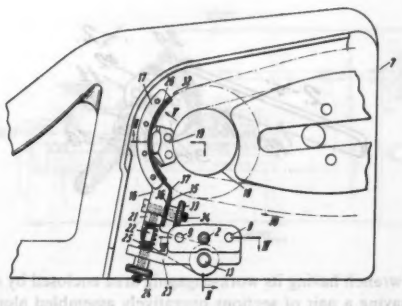


A dual-speed hub for a bicycle is equipped with planetary gearing and with first and second pawl-and-ratchet clutches respectively connecting the hub shell with the driver of the hub, which also serves as planet carrier, and with the faster turning ring gear. The second clutch is normally disengaged by a centrifugal governor whose spring-loaded flyweights are mounted on the pawl carrier of the clutch by means of pivot pins symmetrical relative to the axis of carrier rotation and swing in a common clockwise direction about their pivot axes under the influence of the centrifugal forces sufficient to overcome the flyweight springs. A thin annular disc axially arranged between the flyweights and the carrier couples the flyweights to each other so that they must pivot jointly.

3,603,179
APPARATUS FOR SHARPENING SAW CHAINS OF MOTOR CHAIN SAWS

Hans-Peter Stihl, Hochberg, near Ludwigsburg; Hans Dolata, Neustadt, near Waiblingen; Rolf Sauermilch, Waiblingen, and Herman Lude, Stetten, near Waiblingen, all of, Germany, assignors to Andreas Stihl Maschinenfabrik, Neustadt-Waiblingen, Germany

Filed Jan. 21, 1969, Ser. No. 792,341
Claims priority, application Germany, Jan. 20, 1968, P 16 52 787.0
Int. Cl. B23d *63/00*
U.S. Cl. 76—25 A 31 Claims



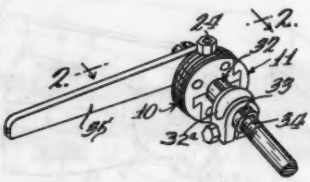
For use in connection with a motor chain saw having a driving sprocket wheel and a saw chain adapted to pass over and be driven by said sprocket wheel, an apparatus for sharpening said saw chain, which comprises: holding means including means for connection to a motor chain saw, the saw chain of which is to be sharpened, said holding means having

a concave surface portion for receiving abrasive means, and biasing means associated with said holding means for biasing said concave surface portion in the direction toward the center of curvature of said concave surface portion.

3,603,180
INSTALLATION TOOL FOR THREADED INSERT
Bruce L. Alexander, San Marino, Calif., assignor to Threadline Fastener Corporation, Covina, Calif.
Filed July 31, 1969, Ser. No. 846,483
Int. Cl. B25b *13/50*
U.S. Cl. 81—53.2 1 Claim

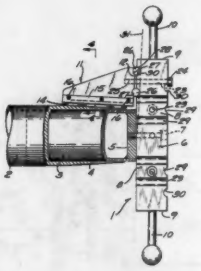
A tool for installing a threaded insert into a workpiece is provided with a screw member threadedly mounted in a shank member. A portion of the screw member projects through an end surface of the shank member for engagement with internal threads in the insert. Cooperating lugs on the members provide an angular lost-motion connection between them.

3,603,181
WRENCH
William E. Shultz, 239 N. Main St., Lombard, Ill.
Filed Aug. 28, 1969, Ser. No. 853,742
Int. Cl. B25b *13/00, 13/02, 13/56*
U.S. Cl. 81—90 6 Claims



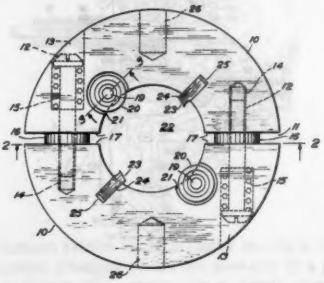
A wrench having its work-engaging area enclosed by a collar having a pair of sections operatively assembled along interengaging tenon and recess means through displacement in a plane extending axially of the turning axis of an article of work in said work-engaging area, and a wedge blade is adjustably supported on one of said sections for movement toward and away from a selected position within said work-receiving area.

3,603,182
SPIGOT-FORMING TOOL
Robert M. Jackman, and William N. McDonald, both of Little Rock, Ark., assignors to A. O. Smith-Inland Inc., Milwaukee, Wis.
Filed May 12, 1969, Ser. No. 823,627
Int. Cl. B23b *5/16*
U.S. Cl. 82—4 C 9 Claims



A spigot-forming tool designed to taper spigot ends of fiber-reinforced plastic hollow articles for fitting into a bell end of another plastic article has a cylinder which fits into the spigot end and serves as a supporting surface for the article wall. A cutting blade is disposed adjacent the outside surface of the spigot end in alignment with the longitudinal axis of the cylinder and is supported by a carriage and head bar attached to the cylinder. The carriage is removably attached to the head bar at a predetermined number of positions in accordance with the varying sizes of articles, and the attachment construction automatically disposes the carriage and blade at the desired spigot-taper angle for the particular size plastic article.

3,603,183
SHAFT-TRUING DEVICES
Denver L. Walker, 754 Glenside Drive, Lafayette, Calif.
Filed Oct. 2, 1969, Ser. No. 863,250
Int. Cl. B23b *5/18*
U.S. Cl. 82—4 B 7 Claims



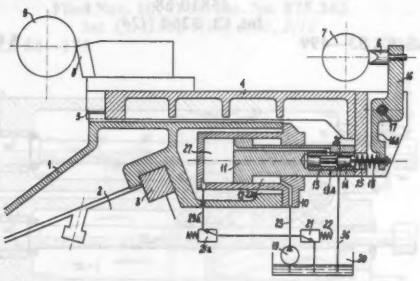
A manually operated, crankpin truing device, adapted to be mounted on a crankpin without removal of the crankshaft from the engine. Machining of the high surfaces on the crankpin is effected by cutters which are urged, by spring action, to contact such surfaces, but are prevented from making contact with the low surfaces by the cam action between the elliptical pin and the shaft-contacting rollers provided for that purpose.

3,603,184

CORRECTION DEVICE FOR MACHINE-TOOLS

Marcel Berly, Garches, France, assignor to H. Ernault-Souma, Paris, France

Filed Feb. 13, 1969, Ser. No. 798,870
Claims priority, application France, Feb. 13, 1968, 139,596
Int. Cl. B23b 3/28
U.S. Cl. 82—14 A 8 Claims



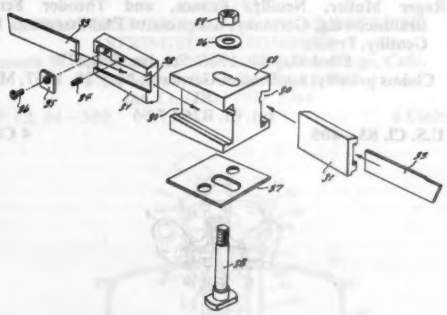
Apparatus and a process for correcting the position of a movable machine element which is positionally controlled by a permanent-circulation hydraulic servomotor copying-control system. Means are provided for measuring the positional error of the element and varying the rate of the liquid supplied to the hydraulic servomotor as a function of the positional error.

3,603,185

METHOD AND TOOL FOR MOUNTING LATHE METAL CUTTING-TOOL BITS FOR USE ON METAL-TURNING LATHES FOR MACHINING OPERATIONS

John B. Curry, 3849 York Blvd., Los Angeles, Calif.

Filed June 9, 1969, Ser. No. 831,403
Int. Cl. B23b 29/24
U.S. Cl. 82—36 R 1 Claim



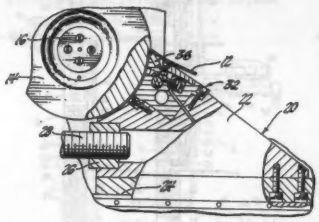
A tool for use on metal-turning lathes so to allow the lathe to do work generally assigned for heavier lathes, the tool comprising a block tool which carries a pair of tool cradles which are slideably fitted to the block tool, and each of the tool cradles comprising a means for supporting a tool bit or cutoff tool bit, while the block tool is secured to the lathe by the anchor bolt.

3,603,186

PEELING MACHINE TOOL CLAMP

Charles W. Vigor, Rochester, and Joseph A. Musial, Dearborn, both of, Mich., assignors to General Motors Corp., Detroit, Mich.

Filed Nov. 28, 1969, Ser. No. 880,869
Int. Cl. B23b 5/14; B26d 1/00; B27l 5/00
U.S. Cl. 82—46 4 Claims



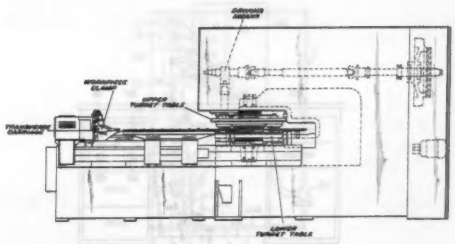
In preferred form, a hydraulic toolholder for retaining an elongated cutting tool in fixed relationship to the peripheral edge of a rotatable cylindrical metal billet for peeling a thin metal strip. The cutting tool is retained in recess in the body portion of the toolholder by a pivotal clamp member which is tightly drawn against the cutting tool by a cam-carrying wedge engaging a shaft interconnected with the clamp member. Hydraulic pressure alternately acting against opposite sides of a piston moves the interconnected wedge into and out of engagement with the shaft to clamp or unclamp the cutting tool.

3,603,187

WORKPIECE CLAMPS FOR COORDINATE TABLES OF TURRET PUNCH

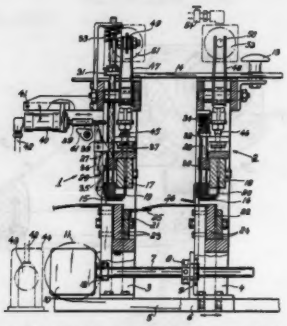
Walter Bredow, Ziegelmasch, Germany, assignor to C. Behrens Aktiengesellschaft, Postfach, Germany

Filed June 11, 1969, Ser. No. 832,373
Claims priority, application Germany, June 12, 1968, P 17 52 546.1
Int. Cl. B26d 7/06, 7/24
U.S. Cl. 83—62 8 Claims



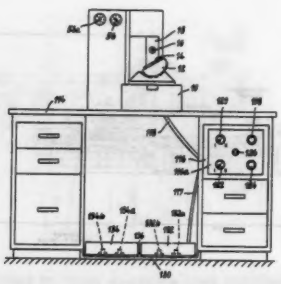
A clamp holder for attachment to a transverse carriage of a coordinate table of a turret punch, and a clamp fixed to said holder for holding a workpiece and an electrical switch with contact means for a drive mechanism of the punch, said clamp being displaceable in relation to said holder and said switch being positioned in relation to said clamp so as to be disconnected if the clamp meets with unintentional resistance to its motion.

3,603,188
CUTTING DEVICES
Richard Rabl, Vienna, Austria, assignor to Firma Akkumulatorenfabrik Dr. Leopold Jungfer
Filed Aug. 15, 1969, Ser. No. 850,471
Claims priority, application Austria, Nov. 11, 1968, A 10969/68
Int. Cl. B26d 5/26, 7/02
U.S. Cl. 83—262 7 Claims



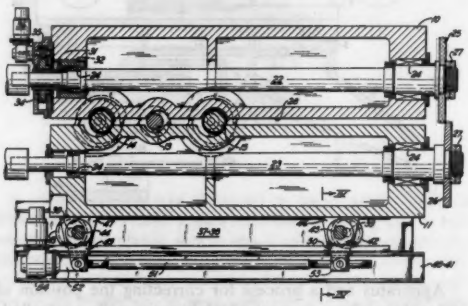
A cutting device for accurate continuous cutting of inherently stiff but flexible strip materials, particularly a sintered plastics powder strip. The device employs two intermittently actuated clamp knife systems adjustable in relation to one another in the travel direction of the strip. A spring-loaded movable clamp in the first system is provided with a one-way coupling member which is locked at the starting position of the systems. Upon triggering of the locked one-way coupling member, the two knives are simultaneously activated. A spring-loaded movable clamp in the second system is directly coupled to the second knife for both directions of its travel. An adjustable feeding device controls the feed of the strip material and the trigger member of the device.

3,603,189
MICROTOME WITH ELECTRICAL DRIVE
Martin Stachl, Munich, Germany, assignor to Carl Zeiss-Stiftung, Brenz, Wuerttemberg, Germany
Filed May 14, 1969, Ser. No. 824,564
Claims priority, application Germany, May 17, 1968, P 17 72 455.9
Int. Cl. G01n 1/06
U.S. Cl. 83—412 4 Claims



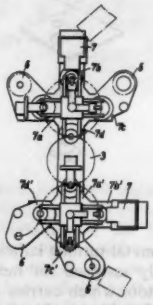
A microtome arrangement comprising a microtome knife, a preparation holder, and an electric motor for producing relative movement of the holder with respect to the knife to effect cutting of a preparation held in the holder includes a foot-operated switch which controls energization and deenergization of the motor so as to free the hands of the operator. A safety switch provides for deenergization of the motor when a motor-driven drive lever for the preparation holder becomes disengaged from the preparation holder and thus prevents damage to the microtome upon jamming or the like. An electromagnetically controlled brake is automatically operated upon deenergization of the motor.

3,603,190
ROTARY PLATE-SLITTING SHEAR
George P. Kollen, Pittsburgh, Pa., assignor to United Engineering and Foundry Co., Pittsburgh, Pa.
Filed Aug. 21, 1969, Ser. No. 851,788
Claims priority, application Great Britain, Sept. 26, 1968, 45810/68
Int. Cl. B26d 1/24
U.S. Cl. 83—499 8 Claims



The present disclosure relates to a rotary blade slitting shear of the type used in the steel industry to divide strip, sheets, and plate into narrower workpieces. The shear comprises two elongated heads adapted to rotatably carry driving shafts to the ends of which are connected cooperating slitting knives. The heads actually are pivotally supported in which the points of pivots serve also as eccentrics which are driven so that the upper knife can be adjusted relative to the lower knife in a vertical plane. The upper knife is also adjustable axially of its drive shaft, for which reason there is provided a driven sleeve and a motor for moving the sleeve axially. The entire shear is adapted to be raised and lowered to properly position the knives relative to the workpiece to be slit.

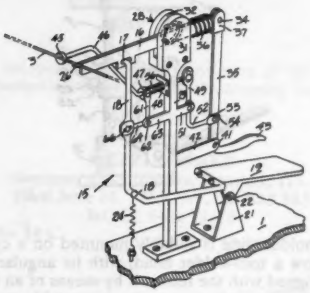
3,603,191
ARRANGEMENT OF TWO OR MORE AUTOMATICALLY OPERATING PUNCHING MACHINES IN FORM OF A COOPERATING MACHINE SET
Roger Muller, Neuilly, France, and Theodor Fenner, Braunschweig, Germany, assignors to Etablissements D.F., Gentilly, France
Filed May 20, 1968, Ser. No. 730,277
Claims priority, application Germany, May 20, 1967, M 74 51
Int. Cl. B26d 7/06
U.S. Cl. 83—405 4 Claims



An arrangement of at least two automatically operated stamping machines in the style of a cooperating machine set,

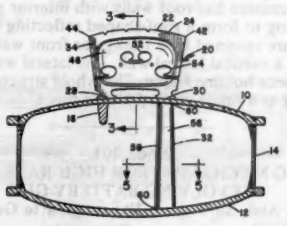
which comprises a plurality of stamping machines disposed in one line and spaced apart equally from each other. A plurality of sheet supporting tables is disposed at a unitary level, and a rotatable transfer table is releasably inserted between each pair of adjacent stamping machines. The transfer tables connect a workpiece depositing station of each of the machines with a feeding station of the next following of the machines.

3,603,192
FOOT-OPERATED BASS-STRINGED MUSICAL INSTRUMENT
James L. Kaar, 519 Ellis St., San Francisco, Calif.
Filed Nov. 10, 1969, Ser. No. 875,342
Int. Cl. G10d *1/00, 1/08, 3/16*
U.S. Cl. 84—173 **12 Claims**



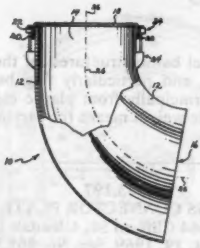
In a foot-operated bass-stringed instrument, in which four tense, electric bass strings are mounted on a vertical backboard; a plurality of chord forming pedals actuated by the left foot, a pedal actuated plucking mechanism; the improvement of an individual plucking pick for each string pivotally supported to pluck the adjacent string, a separate pedal to actuate each pick, and a pivoted heel support for the right foot of the musician to facilitate the turning of the foot over the selected pedals for the respective plucking mechanisms. The plucking mechanism is selective to pluck on the upstroke and downstroke of the pick, or pluck only on the upstroke but to miss the string on the downstroke. A vibration stopping pad is normally pressed against each string and is moved from the string simultaneously with the respective plucking.

3,603,193
SCULPTURED BRIDGE AND SOUND POST FOR STRINGED INSTRUMENTS
Kenneth W. Archibald, 6219 Broadway, San Diego, Calif.
Filed Mar. 2, 1970, Ser. No. 15,496
Int. Cl. G10d *1/02, 3/04*
U.S. Cl. 84—309 **5 Claims**



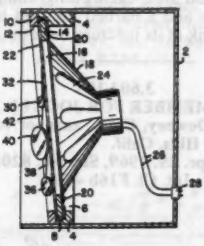
A sculptured bridge and sound-post structure which will reinforce the sound output characteristics, enhance the tone quality and increase the ready response of a stringed instrument, particularly in the violin family. The bridge has concave front and rear faces, reducing the thickness of the central web portion and making the bridge a more functional vibrating part of the sound-reproducing structure. The sculptured sound post further improves the conduction of sound vibrations between the front and back plates of the instrument sound box and the improved elements are readily adaptable to existing instruments without modification.

3,603,194
DRUM
Roger W. North, 21 Beech Glen, Roxbury, Mass.
Filed Mar. 19, 1970, Ser. No. 20,886
Int. Cl. G10d *13/02*
U.S. Cl. 84—411 **4 Claims**



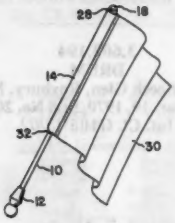
A musical drum having a hollow, elongated body which is open at both ends. The centerline of the drum body bends through an arc for at least a portion of its length. A drum head membrane is stretched across one open end of the drum body. Fasteners are provided to maintain the membrane in tension across the end of the drum body. In the preferred embodiment the cross section of the drum body, taken perpendicular to the centerline, is a circle having an increasing diameter starting at the narrow drum head end and widening out to the open sound emitting end of the drum.

3,603,195
MUSIC-RESPONSIVE LIGHT DISPLAY
Charles S. Williams, Barrington, N.J., assignor to Edmund Scientific Co., Barrington, N.J.
Filed June 21, 1968, Ser. No. 739,086
Int. Cl. A63j *17/00*
U.S. Cl. 84—464 **6 Claims**



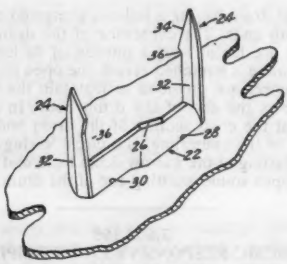
Mirrors are cemented to or suspended by threads from a rubber diaphragm stretched across the face of a loudspeaker in such a way as to trap a volume of air between the diaphragm and the speaker cone. When suspended mirrors are used, the diaphragm slopes slightly forward. A beam of light is directed through a color wheel, and is reflected from the mirrors onto a projection screen or other surface.

3,603,196
BATON STRUCTURE
Eugene W. Dolfi, 312 Frazier Drive, Pittsburgh, Pa.
Filed Oct. 9, 1969, Ser. No. 865,077
Int. Cl. G10g 7/00
U.S. Cl. 84—477 8 Claims



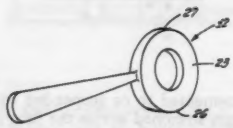
Described are novel baton structures, of the type used by competitive twirlers, and particularly flag baton structures formed entirely or principally from plastic elements and incorporating adjustable weight means for varying the center of gravity of the baton.

3,603,197
TRUSS CONNECTOR PLATE
Gordon G. Wood, 1664 Clifford St., Glendale Heights, Ill.
Filed Sept. 29, 1969, Ser. No. 861,825
Int. Cl. E04c 3/292; F16b 5/00
U.S. Cl. 85—13 10 Claims



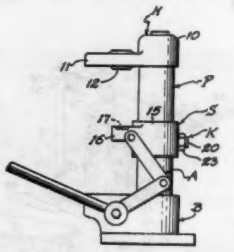
A truss plate is provided comprising a metal sheet having at least one pair of prongs integrally projecting from the undersurface thereof and forming a single elongated slot in said sheet having a central portion wider than the adjacent portions thereof, the prongs of said pair being disposed at the opposite ends of said slot, each prong comprising an elongated narrow shank and a barbed tip, said barbed tip being wider than said shank at its juncture thereto.

3,603,198
FILLER MEMBER FOR JOGGLE JOINT
LeRoy P. Seefeld, Downey, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.
Filed Apr. 29, 1969, Ser. No. 820,050
Int. Cl. F16b 43/00
U.S. Cl. 85—50 2 Claims



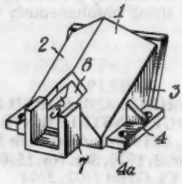
A washerlike filler member including body and tang portions, the latter portion being integrally constructed with the body portion. The body portion serving to occupy the space inherently present in "joggled" joints and the tang portion functioning as an aid in positioning the body portion. The tang portion is broken away or separated from the body portion after the latter has been properly positioned and secured in position.

3,603,199
AMMUNITION-RELOADING PRESS WITH ANGULARLY ADJUSTABLE SLIDE
Lyle S. Corcoran, 730 N. Mariposa Ave., Los Angeles, Calif.
Filed Dec. 8, 1969, Ser. No. 888,213
Int. Cl. F42b 33/02, 33/10
U.S. Cl. 86—24 4 Claims



A casing-holder slide is slidably mounted on a cylindrical pedestal below a tool-holder head, with its angular position adjustably aligned with the tool axis by means of an eccentric key on the tip of an adjustment shank rotatably mounted in the slide and projecting into a vertical keyway in the pedestal.

3,603,200
ROOF-TYPE REFLECTING MIRROR FOR VIEWFINDER OF SINGLE LENS REFLEX CAMERA
Kenji Hiruma, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Toyko, Japan
Continuation of application Ser. No. 633,518, Apr. 25, 1967. This application Apr. 17, 1970, Ser. No. 28,245
Int. Cl. G03b 13/02
U.S. Cl. 88—1.5 R 1 Claim

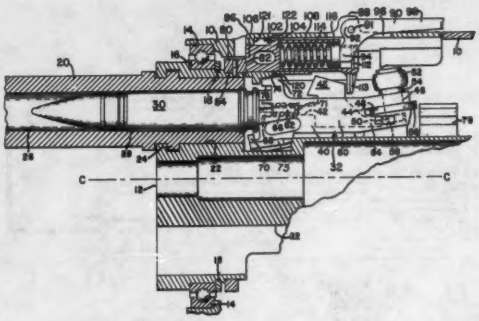


A reflecting mirror for the viewfinder system of a single lens reflex camera has roof walls with interior reflecting surfaces meeting to form a roof-shaped reflecting member. The roof walls are spanned by a triangular front wall and located in place by a vertical lateral wall. The lateral walls are united by an eyepiece holding frame. The whole structure is adapted for molding as a single unitary plastic piece.

3,603,201
FIRING MECHANISM FOR HIGH RATE OF FIRE REVOLVING BATTERY GUN
Anthony J. Aloi, Burlington, Vt., assignor to General Electric Company
Filed Nov. 24, 1969, Ser. No. 879,277
Int. Cl. F41d 7/04
U.S. Cl. 89—12 7 Claims

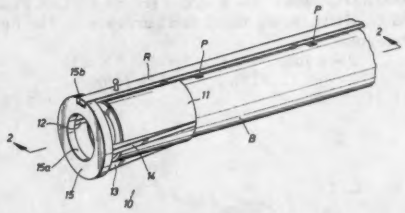
A Gatling gun has a stationary housing with a single-mainspring cocking and firing assembly, and a rotor assembly having a plurality of gun barrels, respective bolts with firing pins

and a rotating cocking and firing control cam. The rotating cam compresses and releases the mainspring to activate the



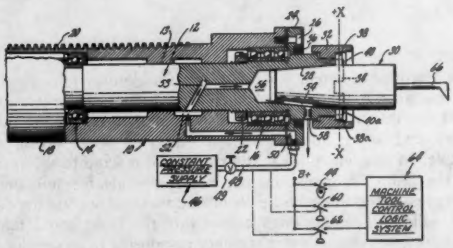
firing pin independently of the translation of the bolt, which bolt is activated by the conventional stationary housing cam.

3,603,202
MUZZLE BRAKE
Edward L. Moragne, 4723 Nenana, Houston, Tex.
Filed June 16, 1969, Ser. No. 833,343
Int. Cl. F41c *21/18*
U.S. Cl. 89—14 C **6 Claims**



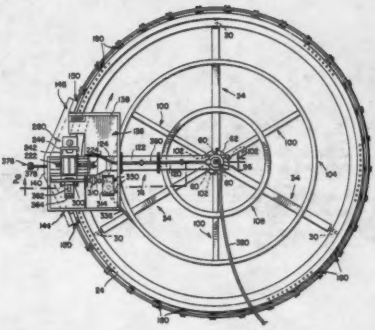
An internally threaded sleeve having three circumferentially spaced supports extending axially beyond one of its ends. A centrally bored, circular plate having its plane transversely disposed to the central axis of the sleeve and secured to the supports at a spaced distance from the end of the sleeve. A depression formed on the circumference of the plate for receiving the rib of a shotgun. The sleeve is threadable on external threads formed on the end of a gun barrel and held against rotational movement by the presence of the gun rib in the plate depression.

3,603,203
PNEUMATIC TOOL-SENSING SYSTEM FOR MACHINE TOOL
Richard P. Rhodes, Vernon, Conn., assignor to Pratt & Whitney Inc., West Hartford, Conn.
Filed Jan. 12, 1970, Ser. No. 2,130
Int. Cl. B23q *17/18*
U.S. Cl. 90—11 A **14 Claims**



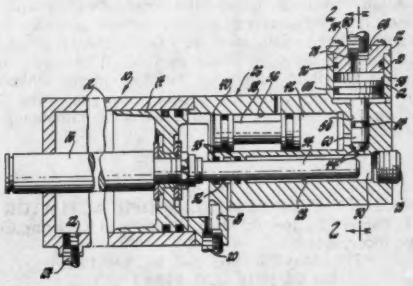
A toolholder has a predetermined radially aligned position in a head spindle for orienting a tool of the single-point type. An airflow path is provided between a bore in the spindle and a groove in the toolholder and thence to an exit port in the spindle. A pressure-sensitive sensing system provides a signal output which indicates whether or not the toolholder is properly loaded and radially aligned in the spindle.

3,603,204
WORK-MOUNTED MACHINING AND FINISHING DEVICE
Lloyd E. Anderson, Sr., Des Moines, Iowa; George C. Harper, Coraopolis, Pa.; William Leber, Pittsburgh, Pa., and Charles G. Miller, Monterrey N. L., Mexico, assignors to Pittsburgh-DesMoines Steel Company, Pittsburg, Pa.
Filed Feb. 20, 1969, Ser. No. 801,030
Int. Cl. B23c *1/20, 3/00*
U.S. Cl. 90—12 **26 Claims**



A pivot support means is adapted to be connected with a workpiece such as a tank or the like, and a pivot arm means is pivotally supported by the support means. A machining means for milling or drilling the workpiece is carried adjacent the outer end of the pivot arm means, this machining means being both radially and vertically adjustable with respect to the pivot arm means. Positive drive means is interconnected between the support means and the pivot arm means for moving the pivot arm means about a pivot axis. Guide means is supported by the outer surface of the associated workpiece and is interengageable with antifriction wheel means on the outer end of the pivot arm means to guide movement of the pivot arm means with respect to the workpiece.

3,603,205
HYDRAULIC LOCK FOR A LINEAR ACTUATOR
Thomas W. Shearer, Jr., Auburn Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 1, 1969, Ser. No. 881,236
Int. Cl. B23d *1/08*
U.S. Cl. 91—45 **2 Claims**



The piston of a pneumatic actuator is releasably locked in extended position by a hydraulic device responsive to the air

pressure in the actuator cylinder. A hydraulic supply reservoir feeds hydraulic fluid through a check valve to a chamber containing a displacement piston attached to the actuator piston so that the pistons are permitted to move to extended position but prevented from returning. A controllable release valve bypassing the check valve is provided to allow return of the hydraulic fluid from the chamber to the reservoir to permit retraction of the actuator piston.

3,603,206

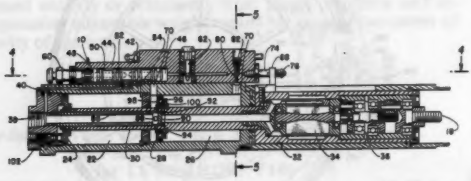
AIR-HYDRAULIC LINEAR FEED DEVICE

Robert C. Quackenbush, Glendale, Calif., assignor to Arthur B. Quackenbush, Glendale, Calif., a part interest

Filed Mar. 16, 1970, Ser. No. 19,663

Int. Cl. F01b *7/16*

U.S. Cl. 91—61 **15 Claims**



A main frame mounts an air cylinder acting through an hydraulic cylinder with the pistons of the two cylinders forwardly connected linearly moving a fluid motor, gear train and spindle forwardly in a feed stroke and rearwardly in a retraction stroke. The hydraulic cylinder controls the speed of the air cylinder during a fast portion of the feed stroke by the flow of hydraulic fluid through a major hydraulic fluid passageway from the forward to the rearward end of hydraulic cylinder, and during a slow portion of the feed stroke, a valve in the major hydraulic fluid passageway shunts the hydraulic fluid through an adjustable needle-valve-controlled, restricted hydraulic fluid passageway. A constant supply of hydraulic fluid is always maintained in the major and restricted hydraulic fluid passageways by a resiliently urged plunger in a supply chamber connected to the major hydraulic fluid passageway. Return of hydraulic fluid to the forward end of the hydraulic cylinder during a fast retraction stroke is permitted directly forwardly through the hydraulic cylinder piston by a series of check valves. Fluid for rotatably driving the fluid motor is directed through a stationary fluid supply tube extending coaxial of the air and hydraulic cylinder pistons and a common piston rod of said pistons rearwardly telescopes the stationary fluid supply tube and forms a movable fluid supply tube communicating with the fluid motor. A valve seat is formed between a radially relieved forward end of the stationary fluid supply tube and an internal annular shoulder of the movable fluid supply tube closing off the fluid supply to the fluid motor when the pistons are in fully retracted position and permitting fluid flow when the pistons are moved forwardly commencing the feed stroke.

3,603,207

MULTIPLE-CYLINDER TELESCOPIC ACTUATOR

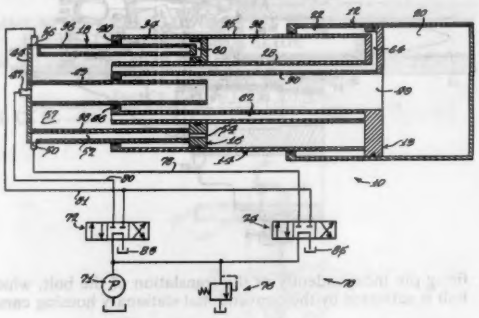
John T. Parrett, St. Joseph, Mich., assignor to Koehring Company, Incorporated

Filed May 26, 1969, Ser. No. 848,128

Int. Cl. F01b *7/20;* **F15b** *11/18*

U.S. Cl. 91—167 **7 Claims**

A hydraulic actuator of the type having multiple pistons and cylinders with porting and passages being provided so that each telescopic section may be selectively extended with respect to the others and also including porting and passages



for selectively retracting each section with respect to the others.

3,603,208

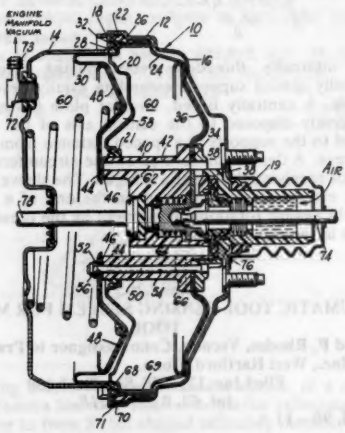
SERVOMOTOR HAVING A ONE-PIECE CENTER PLATE

Oswald O. Kytta, South Bend, Ind., assignor to The Bendix Corporation

Filed June 30, 1969, Ser. No. 837,511

Int. Cl. F15b *9/10;* **F01b** *19/00*

U.S. Cl. 91—376 **7 Claims**



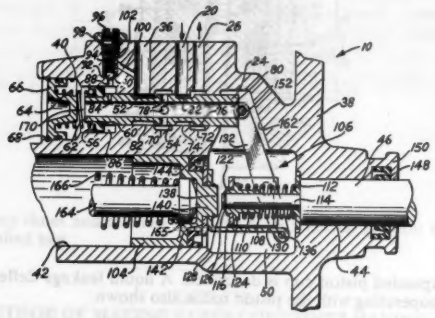
A partition member for dividing a servomotor into a pair of opposing fluid pressure chambers. A first movable wall having a thickened end adjacent a front shell is fixed to the front end of a hub. A second movable wall having a thickened end which abuts the front shell is fixed to the rear of the hub. The partition member surrounds the hub and compresses the thickened ends of said first and second movable walls into sealing engagement with the front and a rear shell, respectively. A valve member responsive to an operator closes a passage within the hub to create a pressure differential across the first and second movable wall to provide a force to operate a power braking system.

3,603,209

HYDRAULIC BRAKE BOOSTER

Stanley I. MacDuff, Dayton Beach, Fla., and Richard L. Lewis, South Bend, Ind., assignors to The Bendix Corporation

Filed Jan. 16, 1969, Ser. No. 793,923
Int. Cl. F15b *13/10, 13/14*
U.S. Cl. 91—391 14 Claims



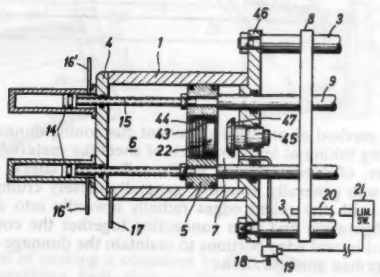
A means to control the use of hydraulic pressure on a piston having a valve element with an adjustable pilot-type relief valve to permit limiting of maximum boost pressure and which is actuatable by a means linked also to the piston so that reduced travel is permitted for power operation and a predetermined mechanical advantage is available for manual actuation of said piston by simple follow through motion.

3,603,210

HYDRAULIC APPARATUS, PREFERABLY CLOSING APPARATUS FOR INJECTION MOLDING MACHINES

Peter Florjancic, St. Martin-Strasse 12, Garmisch-Partenkirchen, Germany

Filed Sept. 23, 1968, Ser. No. 761,768
Claims priority, application Germany, Sept. 25, 1967, P 15 83 629.0
Int. Cl. F15b *15/17, 13/04*
U.S. Cl. 91—404 7 Claims



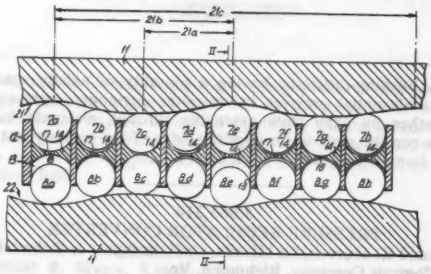
A hydraulic apparatus is provided for moving a member under the action of a small force and for subsequently urging the member against a stop under the action of a large force. The operations are carried out with the aid of pumps and hydraulic pistons which are mechanically connected to the member. The apparatus may be used, e.g., in injection molding machines or blowing machines. A double-acting, working and compensating piston is connected to the member to be moved, e.g., to the movable mold-mounting plate. The pressure chambers disposed in the cylinder at both ends of the piston are hydraulically connected to each other by an opening in the piston. The compensating pressure chamber communicates through an outlet with a chamber which is under a pressure that is lower than the working pressure. The outlet is preferably adapted to be closed. A valve member is provided for the opening in the piston. The piston is provided with sealing means in its opening sleeve, which under the hydraulic working pressure cooperates with the valve member to provide a seal between the working and compensating chambers as soon as the compensating chamber is pressure relieved through the outlet. The valve member is adjustable in the stroke direction.

3,603,211

LINEAR OR ARCUATE HYDRAULIC PUMP OR MOTOR

Donald Firth, and Sinclair Upton Cunningham, both of East Kilbride, Glasgow, Scotland, assignors to National Research Development Corporation, London, England

Continuation of application Ser. No. 644,989, June 9, 1967, now abandoned. This application Aug. 13, 1969, Ser. No. 850,342
Int. Cl. F01l *33/02*; F04b *1/02*
U.S. Cl. 91—501 10 Claims



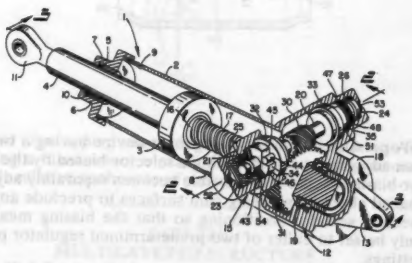
A hydraulic pump or motor having ball pistons, working in cylinders side-by-side in a linear or arcuate array, and engaging an extended linear or arcuate cam track.

3,603,212

SERVO ACTUATOR AND LOCKING MECHANISM THEREFOR

Howard M. Geyer, Dayton, Ohio, assignor to Pneumo Dynamics Corporation, Cleveland, Ohio

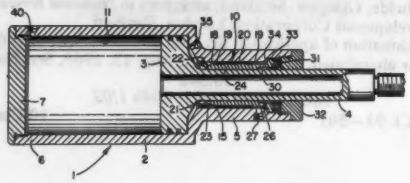
Filed July 9, 1969, Ser. No. 840,232
Int. Cl. F15b *15/26*
U.S. Cl. 92—17 11 Claims



Locking mechanism includes a pair of one-way clutch elements having reverse locking capabilities for locking of an actuator against axial movement in opposite directions upon selective engagement of a pair of braking surfaces with their associated clutch elements by application of an external load to the actuator. A pair of brake release pistons may be selectively actuated to disengage one of such braking surfaces from its associated clutch element to permit movement of the actuator in a desired direction, while at the same time establish firm engagement between the other braking surface

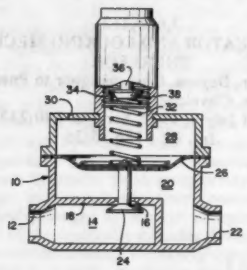
and associated clutch element to prevent an external load acting on the actuator from reversing the direction of actuator movement.

3,603,213
BUSHING-RESTRICTOR
James N. Tootle, Kalamazoo, Mich., assignor to Pneumo Dynamics Corporation, Cleveland, Ohio
Filed Mar. 12, 1969, Ser. No. 806,531
Int. Cl. F16c *37/00, 29/00*
U.S. Cl. 92—153 11 Claims



A bushing-restrictor having a plurality of axially spaced circumferential grooves in its outer periphery, connected together by axial slots extending through alternate lands between the grooves on opposite sides of the bushing-restrictor diametrically across from each other.

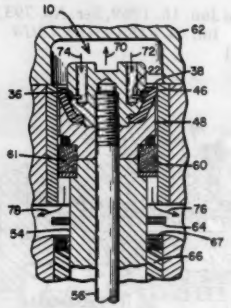
3,603,214
PRESSURE REGULATOR CONVERTER
Donald K. Murrell, La Mirada, Calif., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Sept. 18, 1969, Ser. No. 858,952
Int. Cl. F01b *31/00*
U.S. Cl. 92—133 13 Claims



A pressure regulator changeover device having a two-position adjustment and including a selector biased by the regulator-biasing means and movable between separately adjustable spaced abutments having cam surfaces to preclude any intermediate selector positioning so that the biasing means may only be set to either of two predetermined regulator pressure settings.

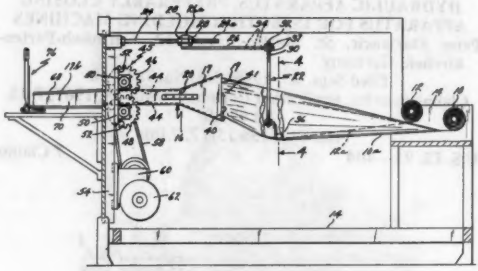
3,603,215
EXPANDED PISTON CUP AND IMPROVED SPREADER
John Leschisin, Minneapolis, Minn., assignor to Hypro, Inc., St. Paul, Minn.
Filed Mar. 28, 1969, Ser. No. 811,300
Int. Cl. F16j *9/08, 15/40*
U.S. Cl. 92—182 1 Claim

An improved spreader for use in an expanded piston cup assembly is shown. A cup spreader having fluid pressure ports in fluid communication with a pressure groove for urging the pressure ring against an inner bearing surface of an



expanded piston cup is described. A liquid leakage deflector cooperating with the piston rod is also shown.

3,603,216
METHOD FOR PRODUCING CUSHIONING DUNNAGE
George R. Johnson, Chagrin Falls, Ohio, assignor to The Arpax Company, Chagrin Falls, Ohio
Division of Ser. No. 703,588, Feb. 7, 1968, Pat. No. 3,509,798.
Filed Feb. 9, 1970, Ser. No. 9,627
Int. Cl. B31f *1/10;* B31d *5/02;* B31c *13/00*
U.S. Cl. 93—1 WZ 4 Claims

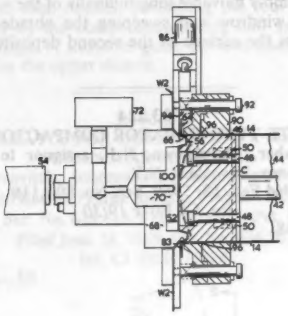


A method of producing resilient cushioning dunnage comprising taking at least one web of sheetlike material, such as paper, of predetermined width, rolling the lateral edges of the web generally inwardly, generally loosely crumpling the web with the rolled edges radially inwardly into a padlike configuration and then connecting together the confronting rolled lateral edge portions to maintain the dunnage article in its formed configuration.

3,603,217
METHOD OF FORMING A BAG
Charles E. Wright, and John Gunyou, both of Toronto, Ontario, Canada, assignors to E.S. & A. Robinson (Canada) Limited, Toronto, Ontario, Canada
Filed Jan. 16, 1969, Ser. No. 791,572
Int. Cl. B31b *49/04, 29/02, 41/60*
U.S. Cl. 93—35 SB 5 Claims

A method for making a thermoplastic bag having limp sidewalls and a semirigid base which will have freestanding properties both when full or empty from flat webs of different thermoplastic materials whereby the heavy gauge, semirigid base is formed in situ, a tube of the lighter wall

material is brought into contact with the formed base, heat sealed to the base which is simultaneously severed from the



heavy sheet and severed from the tube material to form the finished bag.

3,603,218

METHOD OF MAKING PAPER CONTAINER HAVING A HIGH GLOSS EXTERIOR FINISH AND WAX COATED INTERIOR AND BOTTOM SURFACES

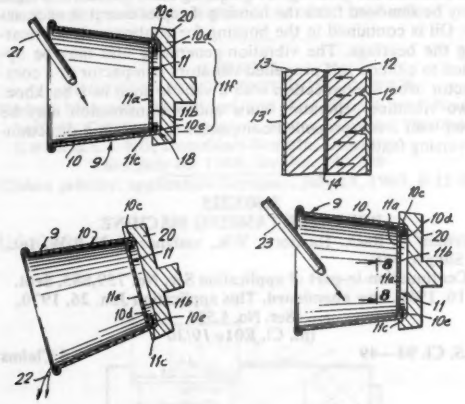
Rodney E. Ludder, Glen Head, N.Y., assignor to Queens Illinois, Inc., Toldeo, Ohio

Original application Oct. 25, 1967, Ser. No. 677,906, now Division of Ser. No. 677,906, Oct. 25, 1967, Pat. No. 3,450,327, Division of Ser. No. 605,338, Dec. 28, 1966, abandoned.

Filed Jan. 17, 1969, Ser. No. 791,914

B31b *1/62, 1/64, 1/88*

U.S. Cl. 93—36 PC **5 Claims**



Method of making a container by first printing and applying an overlying high gloss coating on a container blank adapted to form a container sidewall member having inner and outer plies with blocking adhesive therebetween; then forming said blank into a tubular sidewall member and attaching a preformed bottom member thereto; then holding the formed container such that its sidewall is inclined downwardly towards the open end of the container; applying a first coating of melted wax of particular composition and at a high temperature as set forth in specification, draining the excess wax from the container, and applying a second similar coating of the melted wax but at a lower temperature as described; and applying a melted wax coating to the exterior of the bottom of the container using nozzle guards, all in manner avoiding deposit of wax on high gloss exterior of sidewall member.

3,603,219

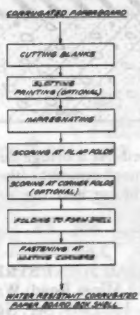
METHOD FOR IMPROVING THE BENDING QUALITY OF WATER RESISTANT CORRUGATED PAPERBOARD

Thomas Hallis, Jr., Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 4, 1966, Ser. No. 539,647

Int. Cl. B31b *49/02, 1/22, 45/00*

U.S. Cl. 193—49 M **8 Claims**



A method for improving the bending quality of corrugated paperboard impregnated with wax or a wax-polymer composition that imparts increased rigidity to the paperboard in which the corrugated paperboard is first impregnated with the wax or wax-polymer composition and then scored at the desired folds.

3,603,220

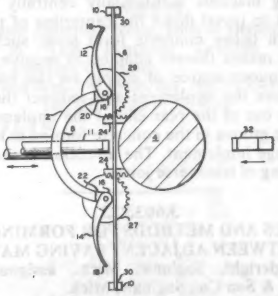
WRAPPING APPARATUS

Michael R. Myers, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 2, 1970, Ser. No. 7,751

Int. Cl. B31c *1/00;* **B31b** *1/52, 1/02*

U.S. Cl. 93—77 R **9 Claims**



A pair of wrapping wings pivotally connected to a base for wrapping a blank about a mandrel, said wings being pivoted at a rate relative to the rate of movement of the base.

3,603,221

MULTILAYERED STRUCTURE

Robert Hall Barton, Ridgewood, N.J.; Martin Luther Brown, Elkton, Md., and Andrew Mitchell, Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

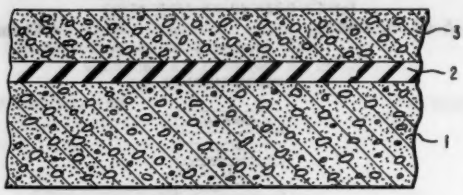
Filed Oct. 30, 1968, Ser. No. 771,993

Int. Cl. E01c *7/18*

U.S. Cl. 94—9 **10 Claims**

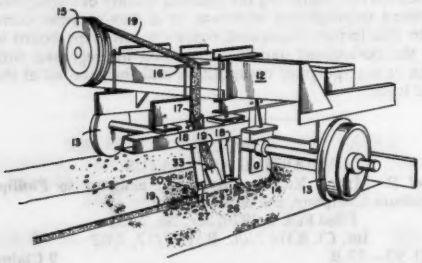
A multilayered structure comprising a base support, an unvulcanized elastomeric membrane at least 0.05 inch thick overcoated with an exposed cover layer. This structure is useful in roadway construction with particular application to

bridge decks where vibration tends to accelerate crack formation allowing water to penetrate the roadbed where it freezes and thaws resulting in structural damage to conventional roadways. The membrane prevents water from



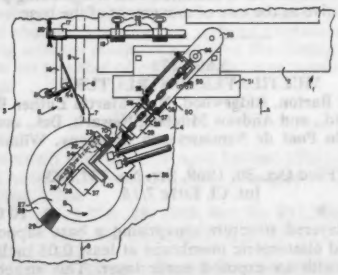
penetrating the roadbed. As a bridge deck the base support is normally Portland cement concrete, the intermediate layer is the elastomeric membrane and the exposed cover layer is asphaltic concrete.

3,603,222
CONCRETE ROAD JOINT STRIP INSTALLER
Robert E. Heltzel, 6922 Mines Road, Warren, Ohio
Filed Mar. 13, 1969, Ser. No. 807,774
Int. Cl. E01c *23/02*
U.S. Cl. 94—39 **7 Claims**



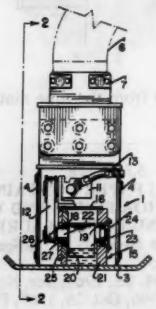
As disclosed a concrete cleavage implement is carried on a road building machine substantially centrally of the road being formed to travel down the centerline of the road at a suitable depth below concrete form level, such implement having guide means therein adapted to receive a joint strip from a continuous source of supply on the machine at an elevation above the implement and redirect the strip vertically flatwise out of the rear end of the implement and into the centerline groove in the concrete formed at least partially by the cleavage implement. The invention is also applicable to the installing of transverse joint.

3,603,223
APPARATUS AND METHODS FOR FORMING A JOINT BETWEEN ADJACENT PAVING MATS
Paul T. Ingleright, Saginaw, Mich., assignor to Frank Strausberg & Son Co., Saginaw, Mich.
Filed Mar. 11, 1969, Ser. No. 806,097
Int. Cl. E01c *19/00*
U.S. Cl. 94—39 **14 Claims**



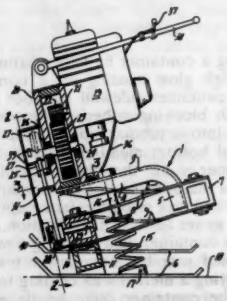
Apparatus and methods for forming a flush joint between two adjacent and sequentially deposited layers of pavement having an overlap therebetween, comprising a scraper blade engageable with the material constituting the overlap to deposit such material in a windrow at the joint and a rotatable brush assembly movable longitudinally of the windrow for abrading the windrow and sweeping the abraded material laterally across the surface of the second deposited layer of pavement.

3,603,224
PLATE-TYPE VIBRATOR COMPACTOR
Seymour Dresher, Morristown, N.J., assignor to Ingersoll-Rand Company, New York, N.Y.
Filed Feb. 18, 1969, Ser. No. 800,119
Int. Cl. E01c *19/30*
U.S. Cl. 94—48 **10 Claims**



A plate-type vibratory compactor which includes an oil-sealed vibrator unit mounted on the sole plate of the compactor. The vibrator unit includes an open-ended housing with bearings and a rotatable eccentric weight removably mounted in the housing. The bearings and eccentric weight may be removed from the housing if replacement is necessary. Oil is contained in the housing for continuously lubricating the bearings. The vibration-generating unit may be applied to either a self-propelled vibratory compactor or a compactor used in connection with a vehicle such as a backhoe. Two vibration-generating units and a transmission may be used with a self-propelled compactor to provide a direction-reversing feature.

3,603,225
PORTABLE TAMPING MACHINE
Herman R. Buck, Hartford, Wis., assignor to M-B-W, Inc., Slinger, Wis.
Continuation-in-part of application Ser. No. 759,885, Sept. 16, 1968, now abandoned. This application Jan. 26, 1970, Ser. No. 5,524
Int. Cl. E01c *19/30*
U.S. Cl. 94—49 **4 Claims**



A device for reciprocatingly driving a tamping tool or the like. The tool is hingedly suspended from a bracket by support springs and is biased downwardly by a compression

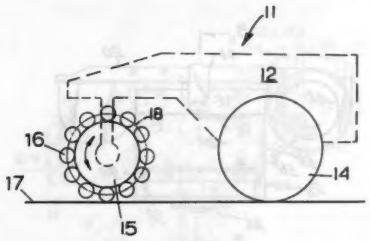
spring. An endless drive belt connects between a lower sheave on the spring support assembly and an upper sheave which is eccentrically driven by a motor. The belt lifts the tool up, and then relaxes, permitting the tool to be forced downwardly by the compression spring and assisted by the support springs. A shiftable guide permits disengagement of the belt from the upper sheave.

3,603,226

APPARATUS FOR COMPACTING A MASS OF GRANULAR MATERIAL

Jacob Marcovitch, Johannesburg, Republic of South Africa, assignor to Rotary Profile Anstalt, Vaduz, Liechtenstein

Division of Ser. No. 615,613, Feb. 13, 1967, Pat. No. 3,533,259.
Filed June 26, 1969, Ser. No. 836,707
Int. Cl. E01c *19/26*
U.S. Cl. 94—50 1 Claim



This invention relates to methods of and apparatus for compacting ground, roads and the like.

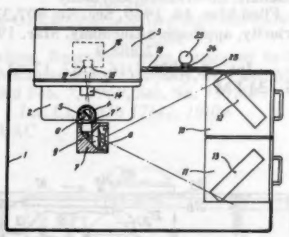
The preferred apparatus comprises a road roller having small diameter ground engaging rolls rolling around a cylindrical backup roll located at the front of the road roller.

3,603,227

PHOTOGRAPHIC-MONITORING DEVICE

Herbert Maronde, Duesseldorf, and Karl Heinz Garitz, Neub, both of, Germany, assignors to Robot Foto und Electronic GmbH & Co. KG, Dusseldorf-Benrath, Germany

Filed July 10, 1968, Ser. No. 743,799
Claims priority, application Germany, July 15, 1967, P 15 97 379.2
Int. Cl. G03b *17/24*
U.S. Cl. 95—1.1 5 Claims



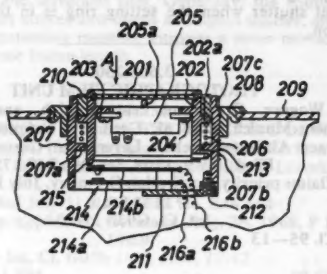
A traffic-monitoring camera is removably mounted on a housing with its primary lens extending horizontally above the housing. Within the housing are instruments, e.g., clock, to be simultaneously photographed. The housing has a fixed holder to which a lens mount is adjustably affixed and positioned in the housing. An auxiliary wide-angle lens is secured in the mount and positioned with its optical axis horizontally and symmetrically between the instruments. Mirrors and a tube provide a path for the light rays from the auxiliary lens to the camera field.

3,603,228

CAMERA RELEASE MEANS

Rudolf Kremp, Gruenwald; Ernst Friedlaender, Leverkusen-Bayerwerk, and Alfred Winkler, Munich, all of, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 17, 1970, Ser. No. 20,274
Claims priority, application Germany, Mar. 19, 1969, P 19 13 865.9
Int. Cl. G03b *17/00*
U.S. Cl. 95—11 R 14 Claims



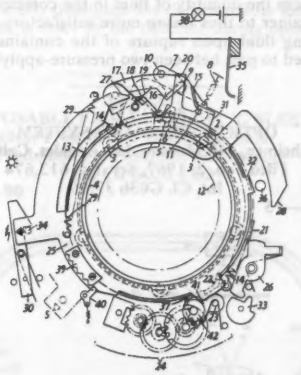
A camera wherein the shutter is opened in response to closing of a first electric switch on deformation of a diaphragm which also effects movement of a holder for the switch with reference to the camera housing to thereby actuate a second switch or a mechanical device which triggers the operation of the exposure control or of an indicator for scene brightness. The holder is movable against the opposition of a spring or a rubber ring which yields to permit closing of the second switch or the operation of the mechanical device before the diaphragm closes the first switch.

3,603,229

FLASHLIGHT IGNITION DEVICE FOR PHOTOGRAPHIC CAMERAS

Rolf Noack, and Johannes Weise, both of Dresden, Germany, assignors to VEB Pentacon Dresden Kamera-und Kinowerke, Dresden, Germany

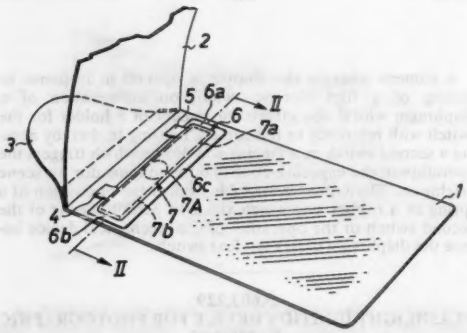
Filed Sept. 19, 1968, Ser. No. 753,489
Int. Cl. G03b *9/70, 9/14*
U.S. Cl. 95—11.5 R 7 Claims



A photographic camera having a housing, a shutter mechanism and an aperture passage is provided with an additional shutter mechanism for flashlight operation purposes. The additional shutter mechanism includes a drive ring mounted within the housing arranged to be driven by a spring, a plurality of shutter blades pivotably mounted on the housing to form an additional shutter adapted to be driven by

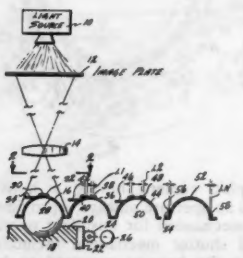
the drive ring between a closed position and a fully open position via a pivoted drive lever, a setting ring mounted on the housing settable into "flash" or "daylight" exposure positions, release means mounted on the housing for locking the drive ring in a cocked position, an actuating member provided on the drive ring for actuating a flash ignition circuit when the drive ring is running-off out of the cocked position in use during a flash exposure, a stop member provided on the setting ring for stopping the drive ring running-off out of the cocked position, a first projection on the setting ring arranged to release the release means when the setting ring is set in the "daylight" position, and a second projection on the setting ring arranged to move the drive lever to open the additional shutter when the setting ring is in the "daylight" position.

3,603,230
PHOTOGRAPHIC FILM UNIT
Karl Wagner, Ottobrunn near Munich, and Hans-Peter Huber, Munich, both of, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed July 9, 1969, Ser. No. 840,177
Claims priority, application Germany, July 11, 1968, P 17 72 844.8
Int. Cl. G03b *17/50*
U.S. Cl. 95—13 **11 Claims**



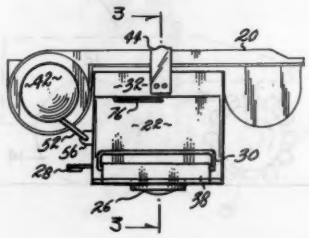
A photographic film unit for use in a camera which develops the film comprises an elongated ruptnrable container for processing fluid extending transversely between the photosensitive and print receiving sheets. The container is provided with a substantially centrally located gas-filled insert or with a substantially centrally located fluid-free portion which reduces the quantity of fluid in the corresponding part of the container to thus insure more satisfactory distribution of processing fluid upon rupture of the container when the film is caused to pass between two pressure-applying rolls.

3,603,231
OPTICAL EXPOSURE SYSTEM
Jess Oppenheimer, 549 Mareno, Los Angeles, Calif.
Filed Feb. 2, 1967, Ser. No. 613,674
Int. Cl. G03b *37/00*
U.S. Cl. 95—15 **10 Claims**



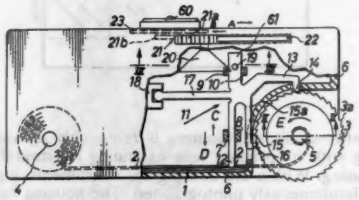
The illustrative embodiments disclose a system for exposing a surface to an optical image, which surface extends in part axially to the optical image. As illustrative of a variety of surfaces, spherical surfaces are disclosed to be exposed by both mechanical apparatus and electrooptical apparatus by synchronously displacing the surface relatively along the optical axis as the image is scanned onto the surface. In one embodiment progressive masks are employed as the focal plane is altered. Another embodiment discloses a flying spot scanner synchronously operated with displacement of the target image along the optical axis.

3,603,232
CASSETTE CAMERA
Richard B. Jones, Highland, Calif., assignor to Perfect Film & Chemical Corporation, New York, N.Y.
Filed Aug. 26, 1968, Ser. No. 755,325
Int. Cl. G03b *17/04, 19/04*
U.S. Cl. 95—31 R **4 Claims**



A small pocket size camera snapped on or off a conventional roll-type film cartridge or cassette having a winding knob attached thereto but movable to operative position and a finger actuated positioning pin temporarily releaseable from conventional film metering apertures to permit film advancement until next automatic engagement in a following aperture. The camera of conventional box-type, lens and shutter is modified outwardly to conceal the winding knob, permit collapse of the positioning pin, align camera and retractible viewfinder for conforming packaging shape. The winding knob camera attachment may form a clutch means.

3,603,233
FILM METERING MECHANISM
Rudolf Kremp, Grunwald near Munich, and Alfred Winkler, Munich, both of, Germany, assignors to AGFA Geracat Aktiengesellschaft, Leverkusen, Germany
Filed Mar. 14, 1969, Ser. No. 807,333
Claims priority, application Germany, Mar. 19, 1968, P 16 22 888.9
Int. Cl. G03b *1/16, 1/62, 17/42*
U.S. Cl. 95—31 FM **19 Claims**



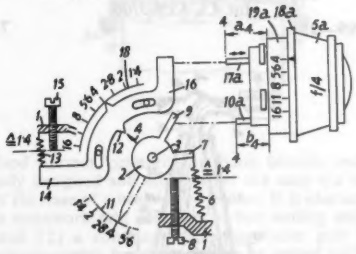
A still camera wherein a slide of synthetic plastic material is movable with the first of its several arms against a line of

perforations on roll film between the supply and takeup reels in response to rotation of the film transporting wheel. The wheel moves the slide by way of a second arm until a third arm of the slide engages the wheel and holds it against rotation when the first arm enters a perforation. The slide can be retracted to respectively disengage its first and third arms from the film and from the wheel in response to actuation of the shutter release. This release is moveable back and forth and actuates a rockable disk-shaped shutter by way of a snap-over spring.

3,603,234
SINGLE-LENS REFLEX CAMERA WITH EXPOSURE METER

Horst Strehle; Walter Hennig; Manfred Wiessner, and Heinz Schulze, all of Dresden, Germany, assignors to VEB Pentacon Dresden Kamera-und Kinowerke, Dresden, Germany

Filed Feb. 13, 1969, Ser. No. 799,060
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **5 Claims**

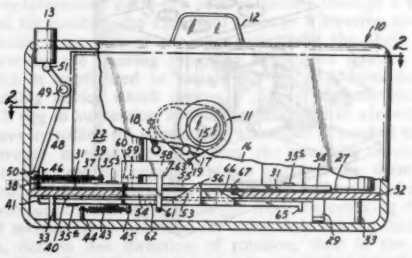


A camera is provided with a photoelectric exposure meter influenced by light passing through a detachable objective lens having a diaphragm presetting control. A first indicating means is influenced by a photoelectric device of the exposure meter and a second indicating means is movable by a first setting element provided on the lens adjustable by the diaphragm presetting control. A second setting element on the lens is positioned according to the maximum aperture of the lens and operates one of the first and second indicating means. Alignment of the first and second indicating means by adjustment of the diaphragm presetting control sets the value required for accurate exposure. A lens without diaphragm presetting control and without setting elements can be used when the first and second indicating means attain a predetermined relative position and alignment of the two indicating means by adjustment of the lens diaphragm indicates that the aperture is set to a value required for accurate exposure.

3,603,235
SHUTTER-OPERATING AND FILM-ADVANCING MECHANISM

Norman E. Nelson, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 7, 1969, Ser. No. 797,407
Int. Cl. G03b *17/42, 19/04*
U.S. Cl. 95—31 AC **5 Claims**

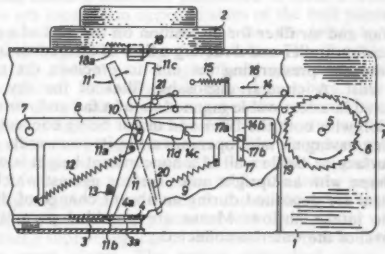


Shutter-operating and film-advancing mechanism designed to assure exposure of each frame of film in a camera but to prevent double-exposure of any one frame of film. The mechanism includes shutter-actuating and film-advance-actuating members movable to energized positions; drive means for advancing the film-advance-actuating member to an energized position; connection means connecting the shutter-actuating member to the film-advance-actuating member so that the former is moved to an energized position as the latter is moved to its energized position; and trigger means operable when the two members are in their energized positions for disconnecting them, whereupon (a) the shutter-actuating member quickly moves to its rest position and operates the shutter and (b) the film-advance-actuating member, upon release of the drive means, later moves to its rest position and advances film. Generally, the shutter-actuating member strikes and opens an impact shutter, and the film-advance-actuating member engages a lever movable to advance film one frame-length.

3,603,236
FILM METERING AND SHUTTER COCKING DEVICE

Dieter Engelsmann, Unterhaching near Munich, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 31, 1969, Ser. No. 846,544
Claims priority, application Germany, Aug. 28, 1968, P 17 97 196.9
Int. Cl. G03b *1/62, 9/68, 17/42*
U.S. Cl. 95—31 FM **10 Claims**

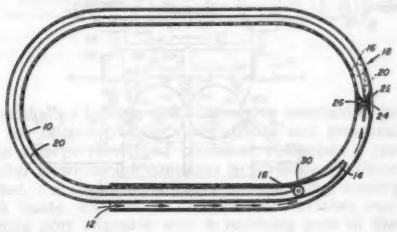


A still camera wherein a pivotable detector scans the moving film and enters a perforation to stress a spring during further transport of the film. The thus cocked detector releases a blocking slide which then prevents further transport of the film and permits actuation of a camera release which in turn permits the detector to leave its cocked position and to thereby open the shutter. The detector is mounted on a control lever which is pivotable by the camera release to thereby disengage the detector from the film. The blocking slide is reset by the detector during opening of the shutter.

3,603,237
DISPOSABLE FILM DEVELOPING SLEEVE

George P. Kelley, 1102 E. 6th, Okmulgee, Okla.

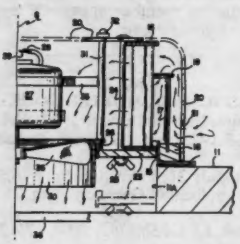
Filed June 24, 1968, Ser. No. 748,119
Int. Cl. G03d *1/02*
U.S. Cl. 95—90 **9 Claims**



A daylight loading film developing sleeve is composed of a flexible, opaque, plastic tubing which is inserted within itself

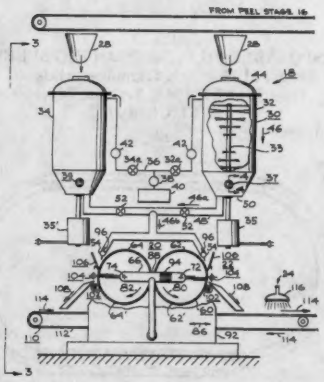
and includes means for retaining the film, inserting and dumping developing fluid chemicals and providing proper agitation and contact between the chemicals and film.

3,603,238
PRESSURIZING DEVICE FOR MOBILE UNITS
Arthur H. Anderson, 195 W. 39th. Ave., Eugene, Oreg., and Roger A. Fox, 2405 N. 35th., Springfield, Oreg.
Filed May 28, 1970, Ser. No. 41,207
Int. Cl. F23l *17/02*
U.S. Cl. 98—64 **8 Claims**



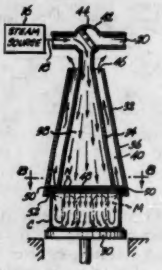
A fan and air filter for disposition on the wall of a camper or vacation trailer and directing a flow of filtered air into said unit thereby pressurizing the unit to preclude the entry of road dust. A circular disposable filter of the dry type is mounted in a removable manner about a fan and motor combination with both the filter and motor being concealed by a housing having air inlet openings along its rearwardly extending surface. A baffle wall of a nonconstant height is of circular shape with an upright outer surface against which water droplets are deposited during an abrupt change of direction in the intake airflow. Means are provided permitting the removal of the water so collected.

3,603,239
COOKED FOOD PRODUCT ARRANGEMENT
Teodoro A. Coutino, Blvd. Liberacion 5-55 Zone 9, Guatemala City, Guatemala
Filed Feb. 20, 1970, Ser. No. 12,931
Int. Cl. A23b *7/00*
U.S. Cl. 99—239 **18 Claims**



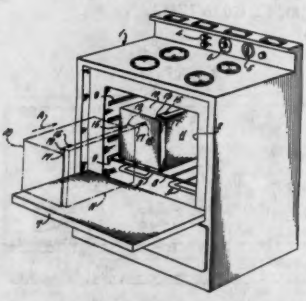
An arrangement for providing a thin chiplike food product from various types of fruits is described. The fruits are stored and exposed to any necessary preconditioning prior to pulping. Pulping takes place in one or more pulping tanks wherein the fruit is reduced to a fluidlike consistency and is transported by, for example, a gas pressure feed from the pulping tanks to a plurality of nozzle means. The nozzle means is positioned adjacent the external surfaces of heated, rotating drums and the fluidlike pulp is discharged from the nozzle means onto the external surfaces of the drums where it is cooked during the dwell time on the drums. Knives are provided adjacent the external surface of the drums for cutting the cooked pulp into desired sizes and shapes and for removing the dried and cut chips on the drum. A transportation means is provided to then transport the thin chiplike flakes to remote regions for appropriate packaging.

3,603,240
MEAT TREATING APPARATUS
Robert McCarthy, Seattle, Wash., assignor to EEFP Corporation, Seattle, Wash.
Division of Ser. No. 500,522, Oct. 22, 1965, Pat. No. 3,476,569.
Filed Oct. 31, 1969, Ser. No. 873,035
Int. Cl. A23l *3/00*
U.S. Cl. 99—251 **7 Claims**



Pieces of raw meat are placed into containers, are subjected to subcook heating and/or pressure, and are then promptly subjected to vacuum extraction, causing removal of melted fats and various enzymic liquescent constituents from the uncooked meat. Next the meat is seasoned and/or preserved in such containers. Steam injection is used to provide both heat and pressure. The steam is both introduced into and exhausted out from a container through a head assembly which covers the open top of the container.

3,603,241
AUTOMATIC FOOD HANDLING APPARATUS
Doris Drucker, 138 N. Mountain Ave., Montclair, N.J.
Filed Feb. 13, 1970, Ser. No. 11,058
Int. Cl. A47j *41/00*
U.S. Cl. 99—335 **10 Claims**



A heat insulating container for the cold storage of food in the interior of the oven of a cooking stove including a clock

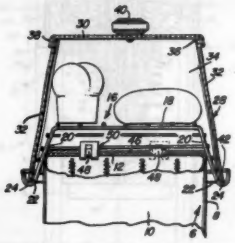
controlled automatic starter. Upon actuation of the heating elements of the oven the cover of the container is removed, and the food is transferred therefrom into the oven without participation of a human operator.

3,603,242

TOASTER ATTACHED BUN WARMER

James R. Murphy, Sr., 739 Palmer Ave., Maywood, N.J.

Filed Dec. 10, 1968, Ser. No. 782,606
Int. Cl. A47j *36/24, 37/08*
U.S. Cl. 99—339 8 Claims



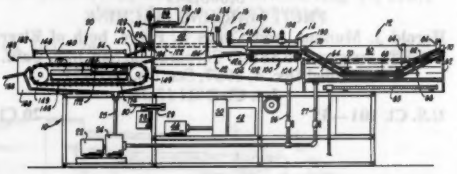
A food warmer, primarily for buns, biscuits and the like, expressly designed and adapted for use atop the slotted top wall of the case of a bread slice toaster. It is characterized by (1) an openwork grid providing a bun seating and warming rack and (2) a complemental imperforate grid supported rack encompassing hood which can be united with or made separate from the grid. The hood can be made of one piece or provided with an applicable and removable lid.

3,603,243

MACHINE FOR PREPARING SHELL-LESS HARD COOKED EGGS

Robert D. Foster, 202 Womble, Camden, Ark.

Filed June 4, 1970, Ser. No. 43,366
Int. Cl. A47j *29/00*
U.S. Cl. 99—355 33 Claims



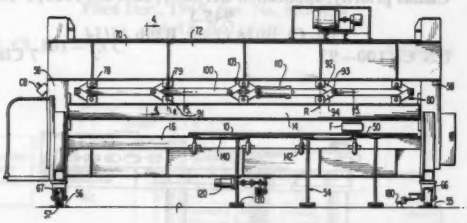
A machine for preparing shell-less hard cooked eggs which includes conveyor means for moving a plurality of eggs along a predetermined path, the path extending through a heated fluid for cooking the eggs, and through a freezing zone for freezing a portion of the eggs just inside the shell. After traversing the freezing zone, the eggs move down a chute which is configured to seriate the eggs. A revolving egg cracking device which carries a pickup element picks up each egg in succession and cracks the shell in a number of places by rolling the eggs across a number of serated bars. A conveyor is positioned adjacent the cracking device for receiving cracked eggs therefrom and moving them to a discharge point. This conveyor includes a plurality of rollers which support the eggs discharged from the cracking device, and mechanism is provided for alternately driving these rollers, first in one direction of rotation, then in the other direction of rotation, as the eggs are moved in translational movement by the conveyor. Liquid spraying apparatus is provided over the conveyor carrying the rollers for impinging a liquid upon the cracked eggs to remove the shells therefrom.

3,603,244

FABRICATING APPARATUS FOR WOODEN TRUSSES, PANELS, AND THE LIKE

John Calvin Jureit, Coral Cables, and Oscar Csakvary, Miami, both of, Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Filed Oct. 20, 1969, Ser. No. 867,730
Claims priority, application Great Britain, Apr. 16, 1969, 19428/69
Int. Cl. B30b *15/18*
U.S. Cl. 100—48 27 Claims



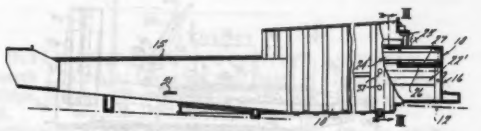
The fabricating apparatus comprises a jig table carrying wooden framing members positioned to form a truss. Nailplates are located on opposite sides of the butt joints of the wooden members for embedment into the joints by a press movable lengthwise along the jib table. The jib table is supported by a plurality of longitudinally spaced pivoted wands comprised of substantially U-shaped members. One leg of each of the pivoted wands engages the undersurface of the jib table to support the latter while its opposite leg lies below the lower press platen and bears against a support preventing pivotal movement of the wand from its table supporting position. As the press traverses the table, the lower press platen successively pivots the wands to locate the other legs of the wands in supporting engagement with the jig table while the previously supporting legs of the wands are pivoted below the lower press platen. The pressis controlled via a circuit responsive to switch actuating pins disposed at selected positions along a track for automatically and sequentially stopping the press when the press overlies successive butt joints, actuating the press to embed the nailplates, and restarting the press for movement along the jig table.

3,603,245

COMPACTION LOADING APPARATUS

Robert J. Ploch, Jackson, Mich., assignor to Kysor Industrial Corporation

Filed Nov. 12, 1969, Ser. No. 875,859
Int. Cl. B30b *15/22*
U.S. Cl. 100—50 15 Claims



A stationary loading and compacting mechanism particularly for injecting waste material into and pressurizing it within a large reinforced container comprises a ramming chamber to which the container to be loaded is detachably coupled, the chamber having a top charging opening into which waste material is dumped and a front outlet or ramming port alignable with a receiving port in the container. A multisectioned rectangular ram assembly consisting of lower and upper ram sections is movable through the ramming chamber and ports and part way into the container to force the material into and compress it within the con-

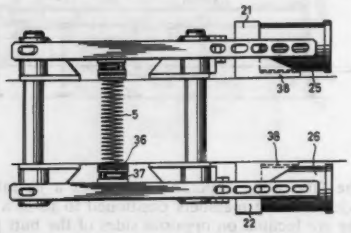
tainer, the two sections of the ram being movable both as a unit and to a limited extent independently of each other.

3,603,246

APPARATUS FOR PRESSURE BONDING TWO OR MORE FRAME MEMBERS IN THE FORMING OF FRAME CORNERS

Erwin Dimter, 7918 Rudolf-Diesel-Strasse 12, Illertissen, Germany

Filed Jan. 14, 1970, Ser. No. 2,748
Claims priority, application Germany, Jan. 28, 1969, P 19 03 945.3
Int. Cl. B02c *11/08*; B30b *15/34*
U.S. Cl. 100—93 **7 Claims**



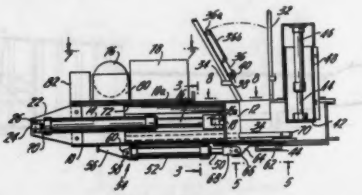
For pressure bonding the joint between two angularly related frame members, a pair of clamps, disposed, one against each side of said frame members and spanning the joint involved, said clamps being interconnected by bolts through the frame members to either side of the joint whereby pressure may be applied at the joint following the application of glue to the joint ends of said frame members. A wedge frame member may be included between the first mentioned frame members and the two joints thus formed may likewise be pressure bonded.

3,603,247

REFUSE COMPACTOR

Howard Price, Kings Point, N.Y., and Seymour Wallick, Clifton, N.J., assignors to International Patents & Development Corp., Kings Point, N.Y.

Filed June 2, 1969, Ser. No. 829,306
Int. Cl. B30b *7/00*
U.S. Cl. 100—139 **4 Claims**



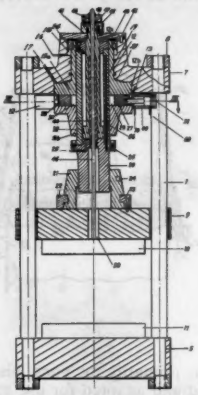
A refuse compactor in which a hydraulic cylinder, pivot mounted at the rear, compacts refuse fed to a compacting space in front of the cylinder, from a chute. A flap mounted within the chute serves to force the refuse into the compacting space from the chute. A fully encased ejection piston operated by a hydraulic cylinder ejects the compacted mass from the compacting space. Guide tracks prevent wobbling of the compacting piston when encountering large-sized obstructions within the refuse.

3,603,248

DEVICE FOR DRIVING THE PLATEN OF A PRESS

Robert Ange Marie Nouel, Paris, France, assignor to Inventions Finance Corporation, Washington, D.C.

Filed July 1, 1969, Ser. No. 838,101
Int. Cl. B30b *15/32*
U.S. Cl. 100—218 **11 Claims**



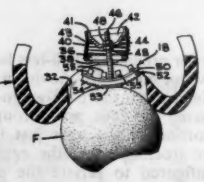
A device for driving the platen of a press, a piston mounted to slide in a cylinder unit, said piston being hydraulically driven, and another piston mounted to slide in a bore of the first piston, said second piston being securely fixed to said platen, and said first piston having means for locking said second piston in its bore, so that said platen can be subjected to a rapid positioning movement by the displacement of said second piston and to a slower movement by the displacement of said first piston when the latter is subjected to high pressure, the movement of said first piston being transmitted to said platen by said locking means.

3,603,249

FRUIT MARKING MACHINE

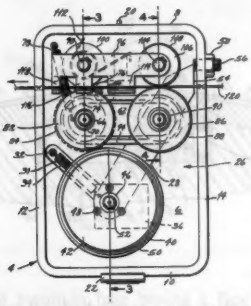
Harold J. Mumma, and Curtis L. Parry, both of Riverside, Calif., assignors to SFMC Corporation, San Jose, Calif.

Filed Dec. 4, 1967, Ser. No. 687,871
Int. Cl. B41f *17/34*
U.S. Cl. 101—35 **20 Claims**



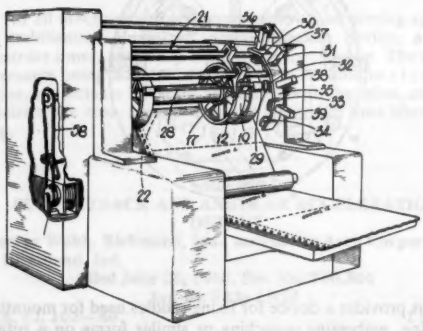
A rotary marking device containing a plurality of angularly spaced markers is mounted for rotation above a continuously moving fruit carrying conveyor and is driven so that each marker will be brought into pressure contact with a fruit on the conveyor to imprint an ink mark thereon. Each marker includes a resilient die holder to grip the fruit and a die having a fruit-contacting face with raised indicia thereon, which die is mounted by means of a coil spring to the peripheral face of the die holder. An inking ribbon is rotated adjaCent the marking device for tangential contact with the fruit-contacting faces of the dies to apply ink thereto.

3,603,250
MARKING DEVICE
David S. Knudsen, St. Louis, Mo., assignor to McKenna Equipment Company Inc., St. Louis, Mo.
Filed Nov. 27, 1968, Ser. No. 779,473
Int. Cl. B41f 17/10
U.S. Cl. 101—36 6 Claims



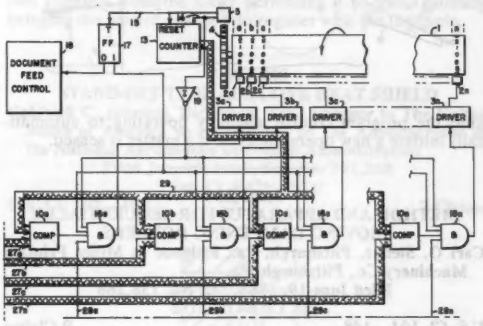
A device for imprinting characters on extended lengths of tape and including a drive roll driven by the tape and a marking roll rotated by the drive roll such that the linear velocity at the periphery of the marking roll is the same as the linear velocity at the periphery at the drive roll. The tape is compressed against raised characters on the periphery of the marking roll by a backup roll and is similarly compressed against the drive roll by a pressure roll. Since the peripheries of the drive roll and marking roll have the same linear velocity, the characters are left as a clear printed impression on the tape, notwithstanding incremental advancement of the tape.

3,603,251
APPARATUS FOR USE IN SEQUENTIALLY NUMBERING DOCUMENTS
John F. Elsworth, West Bromwich; Barry Atkins, Wolverhampton, and Bernard P. Sever, Birmingham, all of, England, assignors to Kenrick & Jefferson Limited, Bromwich, Staffordshire, England
Filed Aug. 15, 1968, Ser. No. 752,877
Claims priority, application Great Britain, Aug. 16, 1967, June 24, 1968, 37692;29914
Int. Cl. B41j 7/36
U.S. Cl. 101—76 7 Claims



Apparatus for sequentially numbering documents with check digits or in high prime skip modes in which one of the numbering wheels of a numbering box has to be indexed irregularly while another is indexed regularly in which a carrier cyclically movable relative to a support carries the numbering box indexing means for indexing the regularly indexed numbering wheel. A series of independently advanceable cam elements coact with a reciprocable indexing element associated with the irregularly indexed numbering wheel and a control device driven in synchronism with the carrier for determining the combination of cams to be advanced after each numbering operation.

3,603,252
ZERO SUPPRESSION CIRCUITS IN HIGH SPEED NUMERIC PRINTING
Louis G. Orsatti, Philadelphia, Pa., assignor to Mohawk Data Sciences Corporation, Herkimer, N.Y.
Filed Dec., 1969, Ser. No. 884,854
Int. Cl. B41j 9/10
U.S. Cl. 101—93 C 4 Claims

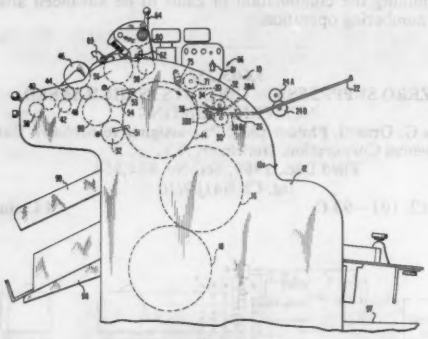


A circuit for selectively suppressing the printing of nonsignificant zeros by a high speed printer which prints numeric characters in successive columns of decreasing significance by individually operating selected print hammers. The circuit includes a plurality of print suppressing circuits, each of which is associated with one of the columns and adapted to inhibit operation of the hammer in its associated column when a nonsignificant zero is to be printed there. When actuated, each print suppressing circuit also feeds a signal to the print suppressing circuit associated with the next least significant column to condition it to inhibit printing of any zeros in the next least significant column since any such zeros will be nonsignificant. A switch is associated with each column to inhibit its associated print suppressing circuit and, thereby, inhibit zero suppression in the column. However, each switch, when closed, also passes a signal to the print suppressing circuit associated with the next least significant column, conditioning it to inhibit printing of any zeros in its associated column. This starts a new zero suppression field in the next least significant column. Of course, the suppression of nonsignificant zeros in this column may also be inhibited by closing the switch associated with the column.

3,603,253
DUPLICATOR PROGRAM CONTROL ASSEMBLY
Kenneth J. Tonkin, Glenview, and John P. Gallagher, Park Ridge, both of, Ill., assignors to A. B. Dick Company, Niles, Ill.
Continuation of application Ser. No. 633,866, Apr. 26, 1967, now abandoned. This application Apr. 17, 1970, Ser. No. 29,690
Int. Cl. B41f 7/02
U.S. Cl. 101—142 9 Claims

The duplicator program control assembly includes a preparation counter responsive to cycles of machine rotation to program the machine through a preduplicating phase of operation and then trigger a postpreparation counter which responds to a sheet count during a duplicating phase of operation and a cycle count during a post duplicating phase to program the machine through these subsequent phases. The program control assembly also includes a master forwarding unit and a sensing unit operable at the termination

of each operational cycle of the machine to sense the presence or absence of a new master sheet in the forwarding



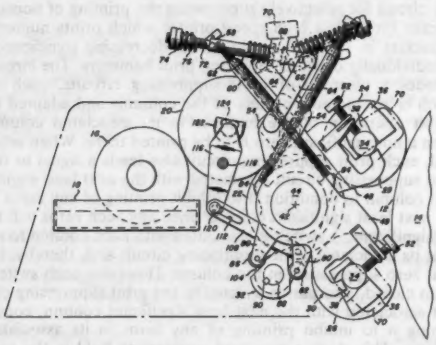
unit; the program control assembly operating to automatically initiate a new operating cycle if a master is sensed.

3,603,254

METHOD AND APPARATUS FOR SEQUENTIALLY MOVING DAMPENING ROLLERS

Carl O. Siebke, Pittsburgh, Pa., assignor to Miller Printing Machinery Co., Pittsburgh, Pa.

Filed June 19, 1968, Ser. No. 738,268
Int. Cl. B41l 25/16
U.S. Cl. 101—148 9 Claims



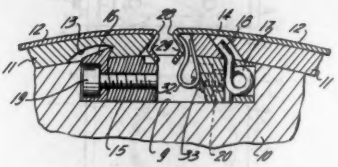
A dampener unit that transfers dampening fluid from a fountain to the surface of a plate cylinder. The dampener unit includes a fountain roller, a metering roller, an intermediate roller and one or more form rollers. The rollers are in series contact and the form rollers transfer the dampening fluid to the surface of the plate cylinder. Cam actuated form roller positioning devices are arranged to sequentially move the form roller away from the surface of the plate cylinder and thereafter move the form rollers away from and out of surface contact with the intermediate roller. A crank arm connected to the same actuator as the cam is connected to a lever mechanism that moves the metering roller away from the fountain roller. The rollers are repositioned in operative dampening fluid transfer position by first moving the metering roller into surface contact with the fountain roller. After the intermediate roller is into surface contact with the intermediate roller. After the form rollers are wetted with dampening fluid, the form rollers are moved into surface contact with the plate cylinder and dampening fluid is transferred from the fountain to the surface of the plate cylinder without ink pickup by the rollers of the dampening unit from the plate cylinder. Suitable drive gearing is associated with the cylinders of the dampening unit to rotate the cylinders at preselected speeds relative to each other.

3,603,255

SADDLE CLAMPING DEVICE

Ellwood J. Horner, Armonk, N.Y., assignor to Wood Industries, Inc., Plainfield, N.J.

Filed June 24, 1968, Ser. No. 739,450
Int. Cl. B41f 27/06
U.S. Cl. 101—378 7 Claims



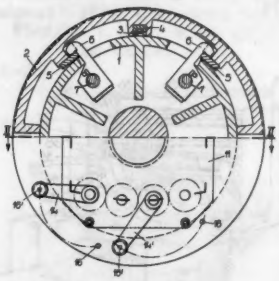
A device for clamping a semicylindrical saddle which supports flexible wraparound plates onto a printing cylinder of a printing press having hook means for engaging an undercut groove at one end of the saddle and biasing means to engage the saddle at the other end so as to tension it about the cylinder. The device is adapted for use in a printing cylinder originally having means for clamping stereotype or electrotype plates and is interchangeable with the stereotype or electrotype clamping means so that the cylinder can be used for printing with either the stereotype means or electrotype plates or the flexible wraparound plates.

3,603,256

DEVICE FOR FIXING FORM SADDLES ON THE ROTARY PRESS FORM CYLINDER

Franz Moos, and Gerhard Loffler, both of Frankenthal, Pfalz, Germany, assignors to Schnellpressenfabrik Frankenthal Albert & Cie, Aktiengesellschaft, Frankenthal, Pfalz, Germany

Filed July 8, 1968, Ser. No. 743,149
Int. Cl. B41f 27/06
U.S. Cl. 101—378 14 Claims



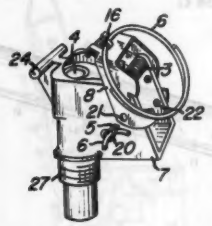
This provides a device for fixing saddles used for mounting printing, embossing, punching or similar forms on a rotary press form cylinder. The device includes tension hooks mounted on eccentric tension spindles and contacting a hook engaging member included on the form saddle. The saddles include a centering means for appropriate location on the cylinder body. The form saddles are fixedly attached to the cylinder body through the use of lever members located outside of the said cylinder body.

3,603,257

FUZE SAFETY MECHANISM

Stanley M. White, North East, and Charles W. Beeker, Parkville, both of, Md., assignors to The United States of America as represented by the Secretary of the Army

Filed Nov. 27, 1968, Ser. No. 779,336
Int. Cl. F42b *27/02*
U.S. Cl. 102—64 12 Claims



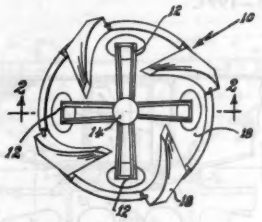
An improved munition fuze having a fuze body, primer means within the fuze body, stroker plate means rotatably mounted on the fuze body and adapted to detonate the primer means, and safety release clip means adapted to engage the stroker plate means to arm the fuze and permit the munition to be shipped, stored, and carried with the fuze in the unarmed state.

3,603,258

MECHANICAL FUZING SYSTEM

Norman F. Green, Minneapolis, Minn., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Oct. 25, 1968, Ser. No. 773,363
Int. Cl. F42c *15/14*
U.S. Cl. 102—79 6 Claims



An all mechanical fuzing system having an arming system, a stabilization timer, an antidisturbance device, a self-destruct timer, and a trip-line release mechanism. The above elements being interconnected so as to be able to (1) arm a mine, (2) actuate the traps associated with the mine, and (3) destruct the mine a predetermined interval of time after arming.

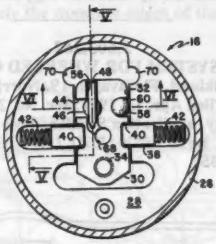
3,603,259

FUZE SETBACK AND ANGULAR ACCELERATION DETENT

George Webb, Richmond, Ind., assignor to Avco Corporation, Richmond, Ind.

Filed June 26, 1968, Ser. No. 740,304
Int. Cl. F42c *15/26*
U.S. Cl. 102—80 1 Claim

A safety fuse is shown incorporated in rocket propelled round of ammunition. Two complementary mechanisms act upon a slider to maintain it in a position wherein a primer charge therein is out of register with a firing pin. When the round of ammunition is discharged from a gun, linear and angular acceleration are effective on a locking ball to overcome the action of a spring and disengage the ball to overcome the action of a spring and disengage the ball from a notch in the slider's guideway. Angular acceleration of the round causes the ball to roll into a laterally extending position in the slider.



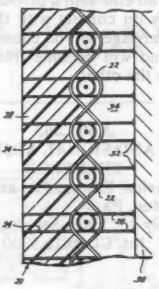
After discharge from the gun, centrifugal force disengages two plungers from the slider permitting it to travel laterally bringing the primer charge into register with the firing pin.

3,603,260

STAND-OFF TYPE ABLATIVE HEAT SHIELD

Caldwell C. Johnson, Dickinson, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Jan. 15, 1969, Ser. No. 791,268
Int. Cl. F42b *13/00*
U.S. Cl. 102—105 7 Claims



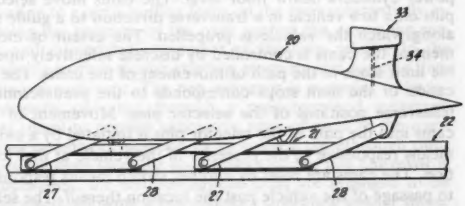
An ablative heat shield for protection against aerodynamic heating of reentry spacecraft comprising a carpet having pile extending from either side of a fabric base. One side of the carpet is impregnated with the standard ablative material, constituting the heat rejection element; and the ends of the pile of the opposite side are adhesively bonded to the substructure of the spacecraft, so that the fabric base "stands off" the substructure by the length of the pile.

3,603,261

HIGH SPEED GROUND TRANSPORTATION VEHICLE

Wayne Melvin Mann, 7111 Glass Slipper Way, Citrus Heights, Calif.

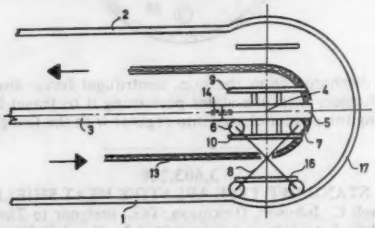
Continuation-in-part of application Ser. No. 632,884, Apr. 18, 1967, now abandoned. This application Feb. 26, 1969, Ser. No. 805,990
Int. Cl. B61b *13/08*
U.S. Cl. 104—23 FS 6 Claims



A vehicle adapted for high speed ground transportation in the 200 to 600 miles per hour range. The vehicle is con-

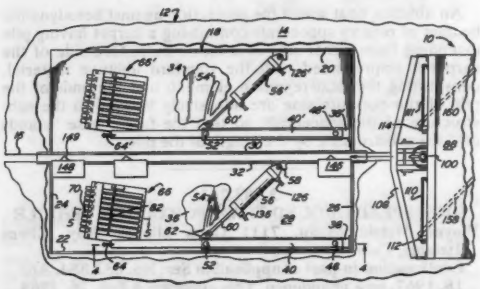
nected to a track by arms adapted to permit the vehicle to move away from the track and become airborne. The connection to the track is by means of air pressure pads.

3,603,262
TRACK SYSTEM FOR WHEELED CARRIAGES
Bjorn Sture Wiklund, Floravagen 19, Norrkoping, Sweden
Filed Apr. 13, 1970, Ser. No. 27,517
Claims priority, application Sweden, June 6, 1969, 8106/69
Int. Cl. B61b *13/00;* **B61f** *13/00;* **E01b** *26/00*
U.S. Cl. 104—35 **8 Claims**



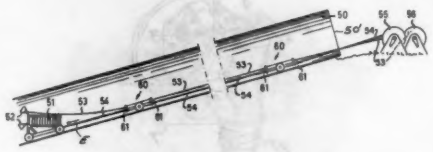
A track system for wheeled carriages comprising a pair of track sections connected by an arcuate track portion and having a center track extending between the track sections and against which the wheels of a carriage ride. The center track is provided at an end with a pivotal portion so arranged as to swing pivotally on contact with the wheels of the carriage whereby the carriage will be caused to follow the arcuate track portion and will become transferred from one of the track sections to the other.

3,603,263
TOW VEHICLE AND SIGNAL ADJUSTING SYSTEM THEREFOR
Egidio Lucas DeOliveira, Easton, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.
Filed July 28, 1969, Ser. No. 847,524
Int. Cl. B61b *9/00*
U.S. Cl. 104—88 **13 Claims**



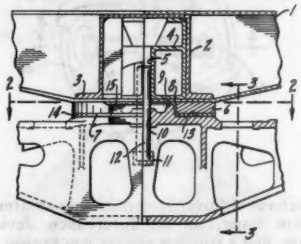
The tow vehicle system disclosed includes pivotably mounted cams above floor level and responsive to discrete power cylinders below floor level. The cams move selector pins on a tow vehicle in a transverse direction to a guide slot along which the vehicle is propelled. The extent of movement of the cams is controlled by discrete selectively operable limit stops in the path of movement of the cams. The location of the limit stops corresponds to the predetermined transverse positions of the selector pins. Movement of the cams into the path of the selector pins is initiated by a switch means responsive to the presence of the vehicle at that location. The cams are reset by another switch means responsive to passage of the vehicle past the location thereof. The selector pins on the front of the vehicle are mounted for pivotable movement about a vertical axis adjacent the rear of the vehicle.

3,603,264
TUBE INSPECTING VEHICLE
Paul Von Arx, Gelterkinderstrasse 31,, CH 4450 Sissach, Switzerland
Filed May 12, 1969, Ser. No. 823,766
Claims priority, application Switzerland, May 14, 1968, 7431/68
Int. Cl. B61b *11/00, 13/00;* **B66f** *9/00*
U.S. Cl. 104—138 G **7 Claims**



An inspection vehicle and device for displacing elongated members, e.g. electrical cables, wires and the like, through tubular bodies such as pipes, conduits, shafts, tunnels and ducts, in which a double-wheel carriage, having the configuration of a gun carriage or bogie, is used. The double-wheel carriages each having an axis extending transversely of the cable and connected thereto, e.g. via clamps or latches, and are spaced apart along a control member running parallel to the cable and provided with abutments which entrain the carriages therewith. The carriages are so connected to the control cable as to allow twisting thereof without effect on the carriages.

3,603,265
RAILWAY CAR CENTER BEARING
Franklin D. Barber, Flossmoor, Ill., assignor to Standard Car Truck Company, Chicago, Ill.
Filed Aug. 8, 1968, Ser. No. 751,196
Int. Cl. B61f *5/16, 5/18;* **F16c** *17/04*
U.S. Cl. 105—199 C **1 Claim**

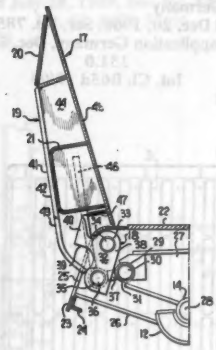


An antirocking centerplate for railroad cars wherein the load on the car is supported on opposed, large diameter, annular bearing surfaces with a friction ring exposed to one of the friction surfaces, centrally disposed means independent of the friction surfaces themselves, for guiding the car body when being assembled into position upon the truck.

3,603,266
TILTING DUMP CAR DOOR HINGE
Henry Fort Flowers, Findlay, Ohio
Filed Mar. 25, 1969, Ser. No. 810,192
Int. Cl. B60p *1/26;* **B11d** *9/02;* **F16c** *35/10*
U.S. Cl. 105—276 **6 Claims**

This disclosure relates to an improvement in a tilting railway dump vehicle, and in particular for a down-turning side door thereof. The side door is hinged at points reinforced by a hollow boxlike structure. The reinforcing box is defined by a portion of the side door, a pair of sidewalls and an outer wall rigidly secured to each other. A reinforcing web is

disposed inside of the box and extends between and is rigidly secured to each of the sidewalls thereof. The side door is pivotally connected to the body of the dump vehicle by hinge

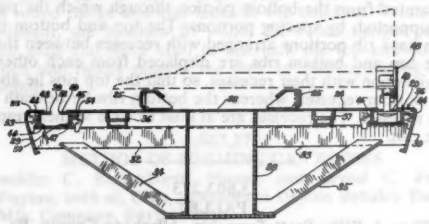


boss means comprising a pair of hinge bosses associated with each reinforcing box whereby each boss is rigidly attached to both the web and one of the sidewalls thereof.

3,603,267
CONTAINER SUPPORT AND SECUREMENT STRUCTURE HAVING COLLAPSIBLE PEDESTALS

Phillip D. Schwiebert, Glencoe, Ill., assignor to MacLean-Fogg Lock Nut Co., Mudelein, Ill.

Filed June 12, 1969, Ser. No. 832,676
Int. Cl. B65j 1/22; B60p 7/08
U.S. Cl. 105—366 D **15 Claims**



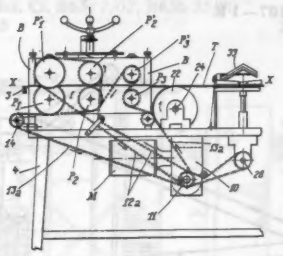
Supporting and securement structure adapted to use on carrier vehicles, including railway flatcars, for the transportation of varied sizes and numbers of box-type containers in which merchandise is shipped; said structure having guide tracks secured to the carrier vehicle structure and one-piece pedestal type supports with integral support portions retained within the guide tracks for movement therealong to predetermined positions of securement and swingable around said support portions between upright and collapsed positions, the support pedestals being constructed and propelled for relative stability in their upright positions and collapsible into relatively small openings in the guide tracks themselves to close said openings when not in use.

3,603,268
PASTRY MAKING MACHINE FOR PRODUCING CRESCENT ROLLS

Antoine Henri Wietzel, and Rene Robert Roche, both of 4, bd. Carnot, 06-, Nice, France

Filed June 18, 1969, Ser. No. 834,298
Claims priority, application France, June 18, 1968, 9219AM
Int. Cl. A21c 5/00
U.S. Cl. 107—4 **10 Claims**

A pastry machine for making crescent rolls comprising a rolling mill for urging dough through cylinders into sheet formation, means conveying the sheet forwardly from the rolling mill or other supplying means, a V-shaped cutter pivoting around an axis parallel to the path of the dough so as to form adjacent triangular dough elements in the sheet which elements face alternately the opposite edges of the dough sheet,

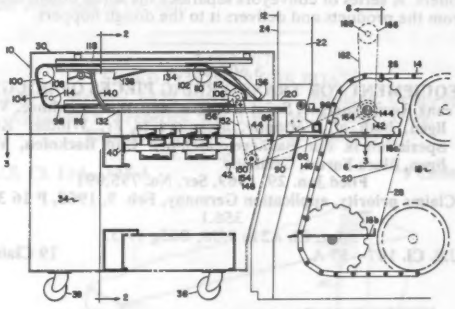


and finally frictional means engaging the base of each successive triangular element to wind the latter around its base into roll shape, after which the roll may be bent into crescent shape.

3,603,269
OVEN LOADING MEANS

Wayne H. Royer, York, Pa., assignor to Teledyne, Inc., York, Pa.

Filed Feb. 16, 1970, Ser. No. 11,580
Int. Cl. A21b 3/07
U.S. Cl. 107—57 A **5 Claims**



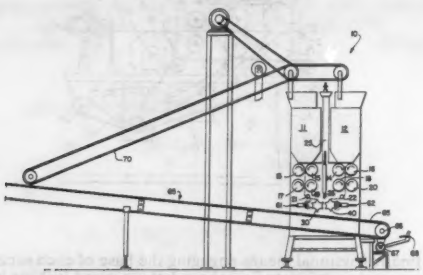
An apparatus for transversely conveying at timed intervals successive rows of pans of dough to a position in front of the loading opening of a commercial type oven and for pushing such successive rows of pans into the oven onto successive trays of a continuously operating endless oven tray conveyor. The pans to be conveyed are made of a magnetic material and the pan conveyor conveying surface is made of a non-magnetic material. Beneath the pan conveyor conveying surface are a series of electromagnetic coils arranged to be energized at such times only when the conveying surface is operating to exert a pulling force on the pans substantially increasing the pressure of the pans against the conveying surface and minimizing movement of the pans relative to the conveying surface during starting, stopping and running time of the pan conveyor. The pan conveyor is arranged to be intermittently operated through a predetermined measured linear travel to present successive rows of pans to the oven loading opening in position to be pushed therethrough onto successive oven trays. At such times that the pan conveyor is not operating, the electromagnetic coils are arranged to be deenergized, allowing a continuously operating pusher timed with the oven tray conveyor, to traverse the pan conveyor conveying surface and push successive rows of pans therefrom onto successive trays of the oven tray conveyor.

3,603,270

MACHINE FOR MAKING FILLED DOUGH PRODUCTS

Frank P. Tangel, Oakland, N.J., assignor to Buitoni Foods Corporation

Filed June 9, 1969, Ser. No. 831,573
Int. Cl. A23g 3/00
U.S. Cl. 107—1 R 20 Claims



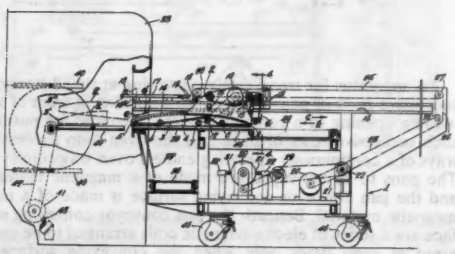
A machine for making filled dough products having two dough hoppers for delivering two dough sheets, between which is a filling hopper. The dough sheets pass to cutter-crimper rollers having pockets which receive the dough sheets and filling, crimp the dough sheets together around the filling, and sever the product from the remaining dough sheet, which is then scrap. The cutter-crimper rollers have a slower peripheral velocity than the final dough rollers. Oil spray nozzles provide lubrication for the cutter-crimper rollers. A receiving belt receives the composite sheet of products and the scrap dough sheet from the cutter-crimper rollers. A series of conveyors separates the scrap dough sheet from the products and delivers it to the dough hoppers.

3,603,271

EQUIPMENT FOR TRANSFERRING PIECES OF DOUGH

Franz Remensperger, Saint Georgen, and Walter Schnee, Villigen, both of, Germany, assignors to Fr. Windler KG, Spezialfabrik Fur Backereimaschinen Und Backofen, Villigen, Black Forest, Germany

Filed Jan. 29, 1969, Ser. No. 795,091
Claims priority, application Germany, Feb. 9, 1968, P 16 32 356.1
Int. Cl. A21c 9/08; B65g 47/52
U.S. Cl. 107—57 A 19 Claims



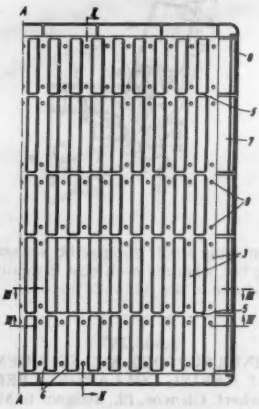
Equipment for transferring pieces of dough brought up on cooking, baking or the like underlays, to a doughpieces carrier by means of a circulating transferring conveyor belt, which projects at both sides in the form of belt tongues and which is disposed in a stationary frame, characterized in that the transferring conveyor belt is disposed on a slide which is able to move to or fro in the direction or counter to the direction of circulation of the conveyor belt, and characterized in that the direction in which the conveyor belt, and characterized in that the direction in which the conveyor belt circulates and direction in which the slide moves are reversible in such a way that the same mechanism can be used both for loading and also for unloading baked goods carriers.

3,603,272

PLASTIC PALLET AND DIE FOR PRODUCING THE SAME

Ernst Ditges, Herzebrock, Westphalia, Germany, assignor to Press-Und Stanswerk Paul Craemer KG, Herzibrock (Westphalia), Germany

Filed Dec. 20, 1968, Ser. No. 785,812
Claims priority, application Germany, Dec. 20, 1967, P 15 56 151.0
Int. Cl. B65d 19/04
U.S. Cl. 108—51 12 Claims



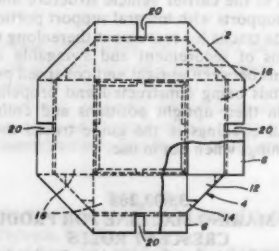
An integrally formed plastic pallet from an injection molding die. The top portion of the pallet for carrying the load is separated from the bottom portion through which the pallet is supported, by spacing portions. The top and bottom portion have rib portions arranged with recesses between them. The top and bottom ribs are displaced from each other in conjunction with their recesses, so that the top ribs lie above the bottom recesses, whereas the bottom ribs lie beneath the top recesses. The recesses are at least as wide as their respective ribs.

3,603,273

PALLET

William J. Riffe, Scott Township, Allegheny County, Pa., assignor to United States Steel Corporation

Filed June 8, 1970, Ser. No. 44,392
Int. Cl. B65d 19/18
U.S. Cl. 108—58 5 Claims



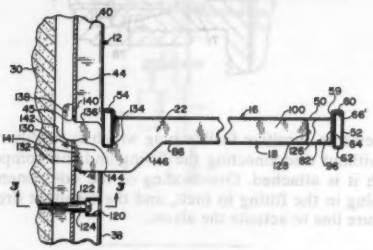
Pallet comprises a load-supporting deck which is attached to and supported by a frame made up of channel sections arranged so that access is provided for receiving the fork of a lift truck from four directions. The supporting deck is welded to the supporting frame and the channel sections of the frame are welded together.

3,603,274

MODULAR ADJUSTABLE WALL SHELVING

Irwin J. Ferdinand, Glencoe, and Irwin R. Kulbersh, Morton Grove, both of, Ill., assignors to Hirsh Company, Skokie, Ill.

Filed July 28, 1969, Ser. No. 845,173
Int. Cl. A47b 57/06
U.S. Cl. 108—108 9 Claims



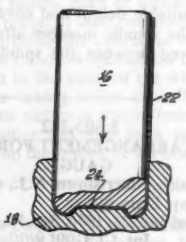
Modular knockdown shelving is disclosed having vertical spaced supports with a plurality of recessed slots for the engagement of adjustable hidden brackets that support the ends of shelf members whereby the brackets lock to the shelves and the supports by the load thereon. A plurality of shelves can be variously positioned in vertically spaced relationship between and upon a pair of upright supports and can be readily adjusted, one to the other, to provide the desired spacing between the shelves. The shelves have a plane top surface with a rolled flange edge and are provided with a bottom panel, also having a flanged edge which interlocks with the rolled flange and also locks to the brackets. In one embodiment, the brackets fit within the rolled flanges of the shelf ends and serve both to interlock the top and bottom panels and rigidly support the shelf in load-supporting relationship.

3,603,275

METHOD OF FORMING CAN BODIES

Franklin C. Eickenhorst, Mason, and Ermal C. Fraze, Dayton, both of, Ohio, assignors to Dayton Reliable Tool & Mfg. Company, Dayton, Ohio

Filed Nov. 6, 1969, Ser. No. 874,620
Int. Cl. B21d 51/00
U.S. Cl. 113—120 H 5 Claims



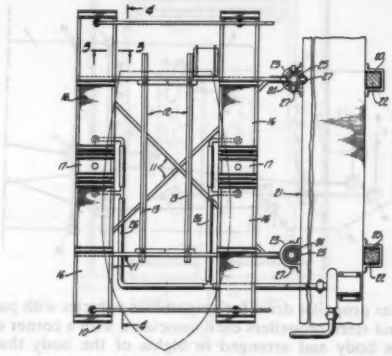
To produce a can body a sheet metal blank is formed into a short cup-shaped workpiece. The cylindrical wall of the workpiece is then thinned and axially elongated by an ironing operation and finally the bottom wall is squeezed to reduce its thickness and to extrude the material thereof in a manner to extend the length of the cylindrical wall.

3,603,276

FLOTATION DOCKING FACILITY FOR SMALL CRAFT

Gaston A. De Lisle, Encino, Calif., assignor to Gaston A. De Lisle, as trustee under a Declaration of Trust dated March 5, 1970

Filed July 18, 1969, Ser. No. 843,078
Int. Cl. B63c 1/02; B63b 35/00
U.S. Cl. 114—45 15 Claims



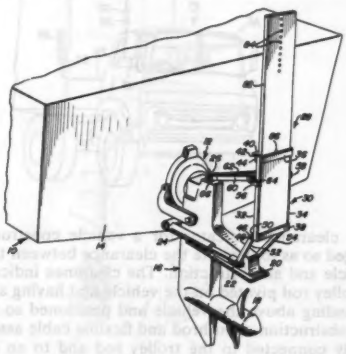
A flotation docking facility for marinecraft slidable vertically of suitable bracket means with rise and fall of the tide and including pontoon-supported cradle means for lifting small craft clear of the water when the craft is not in use. The facility includes adjustable buoyancy means compensating for the weight of the docking facility and effective to support the latter submerged at a level intermediate the seabed and the underside of the hull.

3,603,277

SPEED CONTROL FOR BOATS

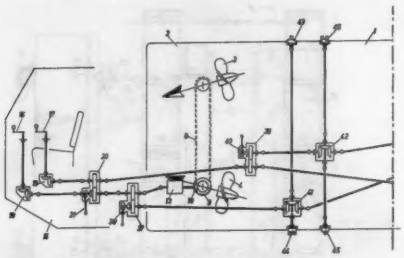
Leslie R. Manary, 6424 North Burr St., Portland, Oreg., and Alexander E. Frederick, Rte. 1 Box 36, Portland, Oreg.

Filed June 11, 1969, Ser. No. 832,345
Int. Cl. B63h 25/44
U.S. Cl. 114—145 A 9 Claims



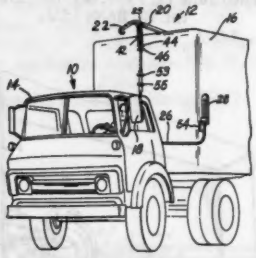
A trolling plate or speed retarder for use on the outdrive unit of an inboard-outboard drive assembly. The speed retarder includes a guide for attachment to the outdrive unit and also an upstanding panel assembly supported from the guide unit for vertical shifting between an upper inoperative position with the lower end portion of the panel assembly disposed above a horizontal plane containing the cavitation plate of the outdrive unit and a lower operative position with the lower end portion of the panel assembly terminating downwardly adjacent a horizontal plane containing the lower most extremity of the outdrive unit and disposed rearwardly of the propeller of the unit.

3,603,278
WATER PROPELLER DRIVE FOR AMPHIBIOUS VEHICLES
Hermann Walter Gehlen, Pirmasenser Strasse 60, Kaiserslautern, Pfalz, Germany
Filed July 3, 1969, Ser. No. 838,871
Int. Cl. B63h *25/42*
U.S. Cl. 115—35 **4 Claims**



Water propeller drive for amphibious vehicles with pairs of bow and stern propellers each associated with a corner of the vehicle body and arranged in bights of the body that are adapted to the current conditions, with steering means for adjusting the directional effect of the four propellers that permit steering of all propellers or a selected number of them optionally by means of one or two operating devices for which purpose suitable coupling and uncoupling means are provided in the steering transmission components.

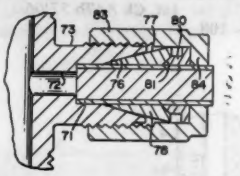
3,603,279
TRAILER TROLLEY INDICATOR
John P. Hooks, 13701 South Kildare Ave., Crestwood, Ill.
Filed June 1, 1970, Ser. No. 41,823
Int. Cl. B60q
U.S. Cl. 116—28 **6 Claims**



A clearance indicator for a vehicle constructed and arranged so as to indicate the clearance between the top of the vehicle and an obstruction. The clearance indicator includes a trolley rod pivoted on the vehicle and having a cam portion extending above the vehicle and positioned so as to engage the obstruction, a pushrod and flexible cable assembly operatively connected to the trolley rod and to an indicator for moving the indicator longitudinally so as to indicate the amount of clearance between the vehicle and the obstruction in response to movement of the trolley rod.

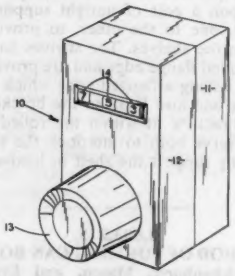
3,603,280
TEMPERATURE SENSITIVE FITTING
Emery J. Zahuranec, Solon, Ohio, assignor to Crawford Fitting Company
Filed Nov. 3, 1969, Ser. No. 873,173
Int. Cl. G01k *1/02*
U.S. Cl. 116—114.5 **7 Claims**

A temperature sensitive fitting which is thermally connected to a component, has a fitting body with a bore therein opening at one end to a static pressure line. An alarm is operatively connected to the static pressure line and senses a drop in pressure therein. A second opening in the fitting body connects the bore with the atmosphere and contains a



temperature sensitive fusible plug which is readily replaceable without disconnecting the fitting and the component to which it is attached. Overheating of the component causes the plug in the fitting to melt, and the resultant drop in the pressure line to actuate the alarm.

3,603,281
DIAL MECHANISM FOR ELECTRONIC COMPONENTS
David B. Froelich, La Mirada, Calif., assignor to Spectrol Electronics Corporation, City of Industry, Calif.
Filed Dec. 15, 1969, Ser. No. 884,932
Int. Cl. G01p *13/00*
U.S. Cl. 116—115 **3 Claims**

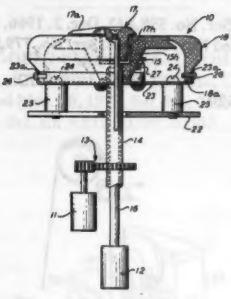


A dial mechanism for an electronic component having a spindle connected to an indicator dial for indicating the rotational position of the shaft of the component removably secured therewith by a setscrew. The shaft of the electronic component is accessible for manipulation through a central aperture in the spindle member to enable the shaft to be accurately phased with indicator dial. A knob member is snapped into a suitable detent and covers the setscrew and the aperture in the spindle member after the desired phase relation is achieved between the spindle member and the shaft.

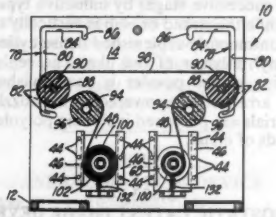
3,603,282
POINTER-DIAL ARRANGEMENT FOR DUAL PRESSURE GAUGE
Andre T. Abromaitis, Morristown, N.J., assignor to McGraw-Edison Company, Elgin, Ill.
Filed Jan. 26, 1970, Ser. No. 5,834
Int. Cl. G09f *9/00*
U.S. Cl. 116—129 **5 Claims**

A dual pressure gauge has an arcuate dial in a plane at right angles to the pointer axis, and has also a disk-shaped dial within the outer arcuate dial and flush therewith. The center dial has a pointer mark registering with the outer dial to measure one pressure. A dual pointer at the center of the two dials has one pointer hand registering with the outer dial to measure a second pressure and has a second pointer hand displaced from the first by 120° and registering with gradua-

tions on the center dial to measure the difference between the two pressures. The dials and dual pointer are made of transparent material and are coated with an opaque material except for the indicia, and a backlighting system is provided to illuminate the indicia.



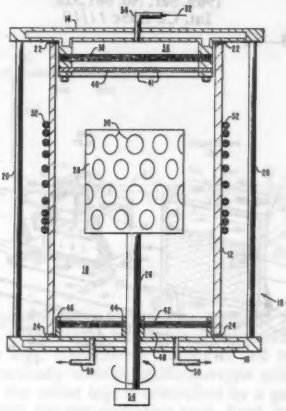
3,603,283
RIBBON-INKING MACHINE
Frank R. Anderson, Montebello, and Albert J. Castro, Cudahy, both of, Calif., assignors to Westates Space Era Products, Inc., Los Angeles, Calif.
Filed Oct. 27, 1969, Ser. No. 869,672
Int. Cl. B05c 11/12, 1/10
U.S. Cl. 118—6 6 Claims



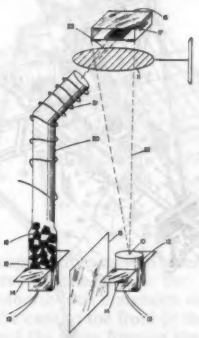
A ribbon-inking machine is disclosed for use in re-inking ribbons employed in various types of computers, accounting machines, printing machines and the like. The machine includes two winding rollers, each of which is also capable of serving as a supply roller, at least one inking roller, and control means for controlling the operation of the winding rollers. In use a roll of ribbon is located on one of the winding rollers and attached to the other of the winding rollers so as to extend past the inking roller or rollers used. As the machine operates the ribbon is wound from one of the winding rollers to the other and then back again, a number of times dependent upon the setting of the control means.

3,603,284
VAPOR DEPOSITION APPARATUS
Richard R. Garnache, South Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 2, 1970, Ser. No. 344
Int. Cl. C23c 11/00
U.S. Cl. 118—48 10 Claims

A vapor deposition reactor having a gaseous phase inlet and exit system including inlet means, located at one end of a reaction chamber, including a porous gas distribution baffle which forms a plenum and which uniformly delivers gaseous materials to substantially all of the horizontal cross-sectional area of the reaction chamber and further including an exit means, located at the other end of the chamber, comprising a porous pressure baffle for uniformly allowing the removal of gaseous materials from the chamber to prevent recirculation of reaction byproducts.



3,603,285
VAPOR DEPOSITION APPARATUS
William S. Nicol, Highcliffe, England, assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Nov. 5, 1968, Ser. No. 773,530
Int. Cl. C23c 11/00
U.S. Cl. 118—48 3 Claims



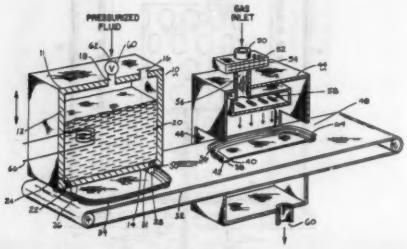
Vapor deposition means include at least two crucibles adapted to contain evaporant materials of different volatilities and which are disposed to each form a vapor stream of uniform density and incident upon a common substrate. A chimney member having an exit disposed in the immediate vicinity of the substrate but outside of the vapor stream of the less volatile material is attached to the crucible containing the material of greater volatility.

3,603,286

COATING APPARATUS

Howard A. Scopp, Windsor, and Thomas F. Sincock, Simburg, both of, Conn., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 660,482, Aug. 14, 1967. Filed July 30, 1969, Ser. No. 861,528
Int. Cl. B05c 11/10
U.S. Cl. 118—64 3 Claims



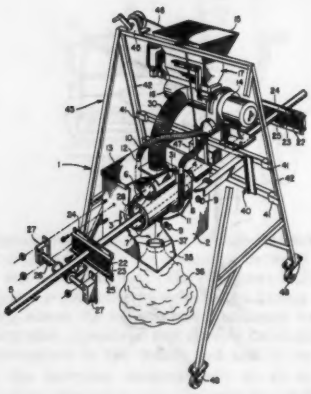
An apparatus for applying a liquid sealant coating to the surface of a package by forcing it from a reservoir through a porous distributing applicator onto the surface.

3,603,287

APPARATUS FOR COATING ELONGATED ARTICLES

Daniel LaMar Christy, Fremont, and Lawrence E. Parker, Clyde, both of, Ohio, assignors to Daniel LaMar Christy, Fremont, Ohio

Filed Oct. 16, 1968, Ser. No. 768,122
Int. Cl. B05b 7/00
U.S. Cl. 118—309 19 Claims



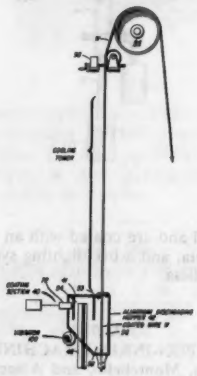
A coating device having a dusting tube into which the coating dust is blown from opposite sides to provide a dust suspension for applying a uniform coating to a workpiece passing therethrough, and a larger chamber surrounding the dusting tube for confining the excess suspension exiting from the open ends of the dusting tube from which a portion of the dust suspension is recirculated back into the dusting tube.

3,603,288

APPARATUS FOR CONTINUOUS COATING OF METALLIC PRODUCTS WITH FUSIBLE PULVERULENT MATERIALS

John S. Case, Towson, Md., and William B. Johnson, Marion, Mass., assignors to Anchor Post Products, Inc., Baltimore, Md.

Division of Ser. No. 598,842, Dec. 2, 1966, abandoned, Filed Nov. 29, 1968, Ser. No. 779,862
No. 779,862
Int. Cl. B05c 3/05, 3/12
U.S. Cl. 118—620 1 Claim



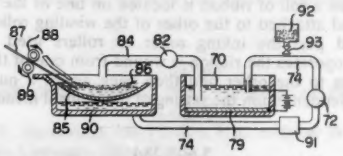
A method and apparatus if described for the coating of running strands or webs with a thermoplastic protective layer. The successive steps comprise the application of a primer and the hot air current drying and curing of same supplemented by inductive heating. The temperature is next raised in two successive stages by inductive type heaters, the latter stage while the strand or web is vertically traversing the length of a continuously-replenished dense cylindrical bed of powdered vinyl polymer of the like. The replenishment as well as cooling of the powder is accomplished through a recirculatory arrangement powered by air nozzles. Alternate coating materials are proposed including polyolefins containing compounds of metal.

3,603,289

ELECTROSTATIC LATENT IMAGE DEVELOPING APPARATUS

Shozo Kasuya, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Dec. 3, 1968, Ser. No. 780,672
Claims priority, application Japan, Dec. 5, 1967, 42/78108
Int. Cl. B05b 5/02
U.S. Cl. 118—637 3 Claims



Apparatus for developing an electrostatic latent image wherein a developing tray is located in a developing chamber, said tray adapted to receive sensitized paper for developing. A supply pipe having a pump therein discharges developing solution onto said tray, said supply pipe receiving the solution from a supply chamber which includes carrier liquid at the other end to the developing chamber. A particle container is connected with said return pipe and contains

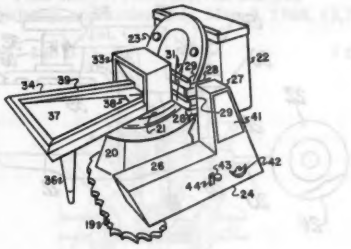
image-producing particles that are charged by an electrode in the nozzle as they pass into the carrier liquid. A concentrate indicator in the return pipe regulates a valve arrangement to allow the particles to pass into the return pipe and be added to the carrier liquid.

3,603,290

PET-OPERATED ANIMAL TOILET

David B. O'Rork, 919 Isleta, Santa Barbara, Calif.

Filed Mar. 20, 1970, Ser. No. 21,249
Int. Cl. A01k *15/00, 05/02*
U.S. Cl. 119—1 **12 Claims**



A pet is trained to excrete upon a tray and to reinforce the training, the pet is given a reward for excreting, such as food from a dispenser operated by the pet. To prevent the pet from cheating, a urine sensor and a feces sensor are located on the tray and an interlock circuit connects them to the dispenser, preventing operation of the dispenser unless at least one of the sensors detects the presence of excrement. To reduce odors, a flushing flow of water may be provided and the human toilet bowl is utilized to receive the animal excrement and the flushing flow. Since water flow is available to the tray, the sensors may be water powered, and the interlock circuit may be water powered.

3,603,291

ANIMAL MARKING DEVICE

Edwin E. Baker, Rt. 1, Richwood, Ohio

Filed Oct. 1, 1969, Ser. No. 862,773
Int. Cl. A01k *11/00*
U.S. Cl. 119—1 **2 Claims**

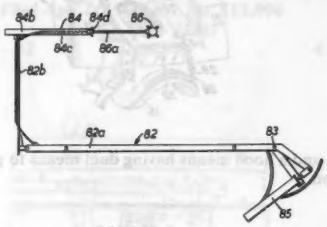
An animal marking device to be worn by a male animal during the breeding season so constructed that when the animal has coition with a female, the female will be marked in such a manner that the stock breeder will be able to determine the time at which the period of gestation should end, should the animal have been rendered pregnant.

3,603,292

AUTOMATED STALL AND MILKING EQUIPMENT

Nigel Finch, Chedworth, Cheltenham, England, assignor to Alfa-Laval Aktiebolag, Tumba, Sweden

Filed July 17, 1969, Ser. No. 842,589
Int. Cl. A01j *07/00*
U.S. Cl. 119—14.1 **8 Claims**



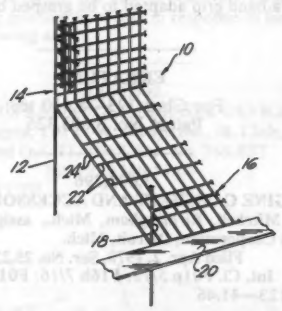
A milking parlor has a forked entry passage feeding two rows of stalls. The passage has an entry separated from each of two outlet legs, respectively leading to the two rows of stalls, by a vertically slidable guillotine-type gate. The exit from each of the outlet legs is controlled by a gate which is also of vertically slidable guillotine type. Each stall includes milk controlled teat cup and claw moving equipment having an articulated linkage arm which moves the claw relative to a support. Automation power means are provided for moving the arm between operative and inoperative milking positions.

3,603,293

EGG-ROLLING CAGE BOTTOM WIRE MESH

Willis R. Voran, Zeeland, Mich., assignor to U.S. Industries, Inc., New York, N.Y.

Filed May 15, 1969, Ser. No. 824,767
Int. Cl. A01k *31/16*
U.S. Cl. 119—48 **3 Claims**



An egg-rolling cage bottom mesh wherein the openings are approximately three-fourths inch × two inches, the wires forming the three-fourth-inch dimension sloping downwardly from the rear of the cage to the front of the cage to form the sloping bottom, and the wires forming the 2-inch dimension being welded to the underside of the aforesaid wires.

3,603,294

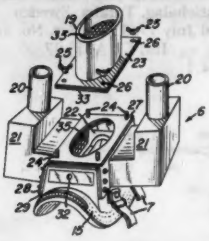
RABBIT ENVIRONMENTAL HOOD AND RESTRAINER

William D. Winston, Jr., Baton Rouge, La., and John F. Callahan, Baldwin, Md., assignors to The United States of America as represented by the Secretary of the Army

Filed Mar. 3, 1970, Ser. No. 16,104
Int. Cl. A61d *03/00*
U.S. Cl. 119—103 **10 Claims**

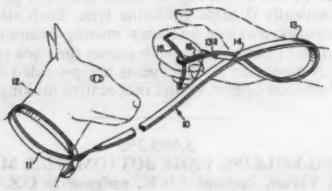
A portable apparatus and method for exposing a portion of an animal's anatomy to environmental test conditions while

the remainder of the anatomy is subjected to normal ambient conditions; the apparatus consisting of an animal restrainer



means and a hood means having duct means to permit air circulation.

3,603,295
ANIMAL LEASHES
Norman Shuman, 1 Tennis Court, Brooklyn, N.Y.
Filed Mar. 10, 1970, Ser. No. 18,120
Int. Cl. A01k *27/00, 01/06*
U.S. Cl. 119—109 **10 Claims**

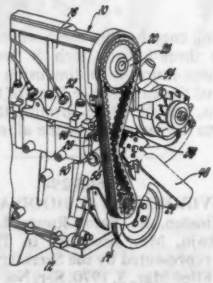


A relatively large dog or other animal on a leash of the type commonly available on the market may on occasion pull hard enough to slip the leash from the hand holding it. The instant leash prevents this by including a noose loop encircling the hand or wrist and, attached to the free extremity of the loop, a hand grip adapted to be grasped by the user's fingers.

ERRATUM

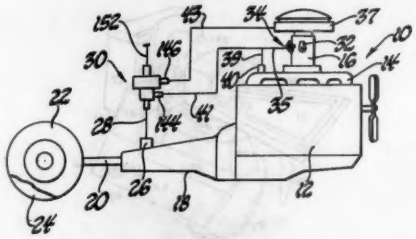
For Class 123—8.410 see:
Patent No. 3,603,326

3,603,296
ENGINE CAMSHAFT AND ACCESSORY DRIVE
Boris J. Mitchell, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 2, 1970, Ser. No. 25,229
Int. Cl. F01p *5/12;* **F16h** *7/16;* **F01l** *1/04*
U.S. Cl. 123—41.46 **2 Claims**



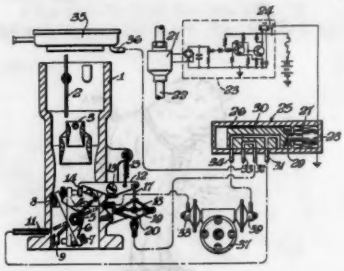
An overhead camshaft engine has a toothed belt drive wherein the back side of the belt is grooved to mate with multiple vee grooves and ridges of the water pump and fan drive pulley. The water pump is laterally movable on the engine block to provide a belt tension adjustment. The arrangement provides positive drive of the camshaft with nonpositive drive of the water pump and fan to permit slippage of the latter during excessive torque loadings.

3,603,297
THROTTLE CONTROL
Harry A. Sherwin, 11724 Amel Drive, Warren, Mich., and Ronald E. Herman, 5342 Streekerk Road, Warren, Mich.
Filed Oct. 1, 1969, Ser. No. 862,720
Int. Cl. F02d *9/00;* **F01b** *15/02, 19/00*
U.S. Cl. 123—97 B **3 Claims**



A carburetor having an induction passage with a rotatable throttle valve therein is provided with a vacuum responsive throttle stop assembly which is effective for engaging the throttle lever in order to at times maintain the throttle valve partly opened during deceleration; a vehicle speed responsive valve member serves to dissipate available vacuum below a predetermined vehicle road speed in order to permit the stop assembly to hold the throttle valve partly opened only during deceleration occurring at or above a predetermined vehicle road speed.

3,603,298
ARRANGEMENT FOR CONTROLLING DISCHARGE OF UNBURNT HYDROCARBONS FROM DECELERATING AUTOMOBILE ENGINE
Tadahide Toda; Norihiko Nakamura, and Kiyohiko Oishi, all of Sunto-Gun, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota City, Japan
Filed Aug. 28, 1969, Ser. No. 853,669
Claims priority, application Japan, Sept. 3, 1968, 43-62901
Int. Cl. F02p *5/04;* **F02d** *3/00, 11/10*
U.S. Cl. 123—117 A **2 Claims**



An arrangement for controlling discharge of unburnt hydrocarbons from decelerating automobile engine by holding throttle valve of engine carburetor open at position slightly more open that position of valve under idling conditions of engine comprises lever connected to throttle valve for movement therewith. Blocking structure moves into and out of engagement with lever for preventing throttle valve from reaching idling position when blocking structure engages lever. Motivating system operates to move blocking

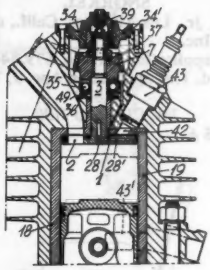
structure into engagement with lever when automobile engine decelerates from above predetermined speed so that throttle valve is held open. Motivating system includes driving device connected to operate blocking structure, speed detector for sensing speed of automobile engine, and speed setter associated with speed detector and driving device for causing driving devices to move blocking structure into engagement with lever when automobile engine decelerates from above predetermined speed.

3,603,299

ROTATING DISTRIBUTOR DEVICE SEATED WITHIN THE CYLINDER HEAD FOR ENDOTHERMIC TWO- OR FOUR-STROKE-CYCLE OR DIESEL ENGINES

Enrico Lamperti, Via Ercole Ferrario, 4, Gallarate Varese, Italy

Filed Mar. 7, 1969, Ser. No. 805,126
Claims priority, application Italy, Mar. 9, 1968, 13,754
Int. Cl. F01l *7/00*
U.S. Cl. 123—190 D **7 Claims**



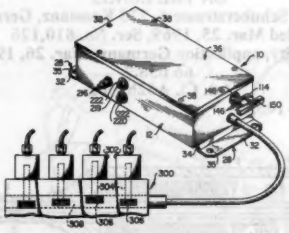
A rotary disc valve for reciprocating internal combustion engines constitutes a disc mounted adjacent the end wall of a cylinder for rotation concentric with the cylinder axis. The disc has annular seals provided in the peripheral surface of the disc and the surface facing the end wall, there being a gap between the disc and the end wall to contain lubricating fluid and means to feed lubricant to the gap and to maintain the spacing of the gap constant.

3,603,300

SAFETY SHUTDOWN DEVICE FOR STATIONARY DIESEL ENGINES

Oren D. Moffett, Tulsa, Okla., assignor to Frank W. Manufacturer Inc., Tulsa, Okla.

Filed Dec. 19, 1969, Ser. No. 886,703
Int. Cl. F02b *77/08;* **F01m** *1/24*
U.S. Cl. 123—198 DB **8 Claims**



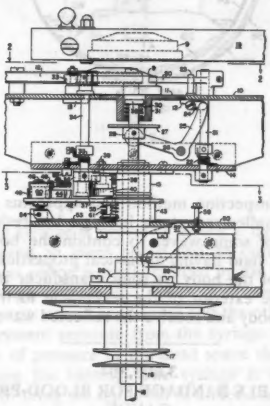
A spring loaded bar normally held in a latched position against the spring bias, the bar being connected to one end of a flexible cable having its other end connected to a conventional internal combustion engine gear rack which is to be actuated upon engine malfunction, a normally open electrical circuit including electromagnetic means operable upon the energization of said circuit to release the latch to permit the bar to move rapidly in the direction of the spring bias, thereby rapidly pulling said cable and its connected rack to effect the engine shut down and to substantially simultaneously open the circuit to the electromagnetic means.

3,603,301

TARGET TRAP

George H. Darrell, 25 Chestnut Street, Dedham, Mass.

Filed Apr. 1, 1969, Ser. No. 812,096
Int. Cl. F41b *15/00*
U.S. Cl. 124—32 **4 Claims**



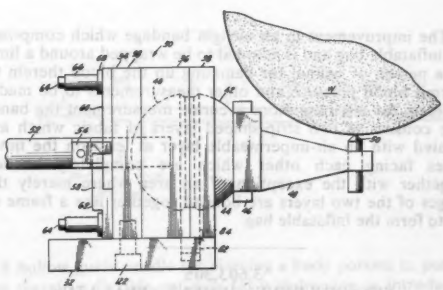
In the target throwing machine disclosed herein, the gate which controls the release of a target from a rotary throwing arm is normally biased towards a target releasing position and is selectively held in target retaining position by a latch. After releasing a target, the gate is positively returned to its target retaining position by a cam in response to further rotation of the throwing arm.

3,603,302

RADIUS AND ANGLE DRESSER DEVICE

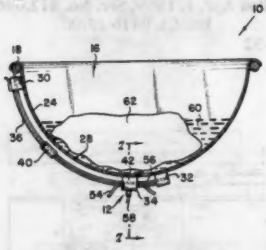
Jean Francis Payea, 114 F. W. Moore Rd., St. Clair, Mich.

Filed Oct. 11, 1968, Ser. No. 766,837
Int. Cl. B24b *53/08*
U.S. Cl. 125—11 TP **10 Claims**



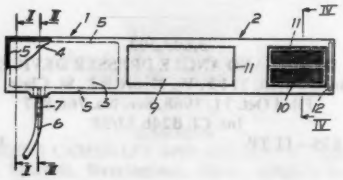
A device for dressing the peripheral surface of grinding wheels having a dresser mounted on a spherical element for universal movement with a handle projecting through an adjustable pattern opening to determine the shape on the grinding surface by guiding the movement of the dresser.

3,603,303
SONIC INSPECTION METHOD AND APPARATUS
James R. Stouffer, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.
Filed Oct. 8, 1968, Ser. No. 765,918
Int. Cl. A61b 10/00
U.S. Cl. 128—2 R 15 Claims



The sonic inspection method and apparatus includes the use of a thin walled receptacle having a low resistance to the transmission of sonic waves to contain the body to be inspected and a fluid having acoustical properties corresponding to those of the body. A sonic transducer is acoustically coupled to the exterior of the receptacle to transmit sonic waves to the body and receive the reflected waves therefrom.

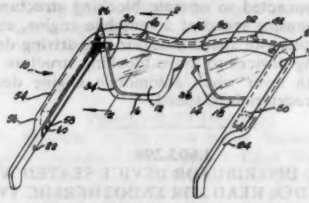
3,603,304
INFLATABLE BANDAGE FOR BLOOD-PRESSURE GAUGE
Werner Maier, Leinenweberstrasse 54, 7000 Stuttgart-Mohringen, Germany
Filed Aug. 18, 1967, Ser. No. 661,703
Claims priority, application Germany, Aug. 31, 1966, M 70 762 IXd/30a
Int. Cl. A61b 5/02
U.S. Cl. 128—2.05 C 2 Claims



The improvement in an airtight bandage which comprises an inflatable bag and is adapted to be wrapped around a limb of a person or animal for damming up the blood therein to permit blood pressure and other measurements to be made, wherein for attaining more accurate measurement the bandage consists of two strip-shaped layers of fabric which are coated with an air-impermeable layer at least on the inner sides facing each other which are completely bonded together with the exception of an area where merely the edges of the two layers are bonded together like a frame so as to form the inflatable bag.

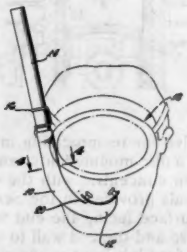
3,603,305
SENSORY DEVELOPMENT APPARATUS
Jess Oppenheimer, 549 Moreno, Los Angeles, Calif.
Filed Apr. 24, 1969, Ser. No. 819,001
Int. Cl. A61h 5/00
U.S. Cl. 128—76.5 8 Claims

Sensory development apparatus in the form of an optical frame carrying eyepieces in which perception therethrough is recurrently and selectively diminished. In one embodiment, light is flashed recurrently against the inner surfaces of alternate eyepieces to diminish perception therethrough. In



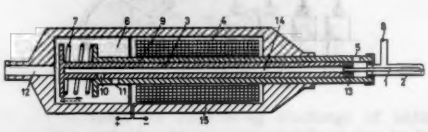
another embodiment liquid crystal is contained by the eyepieces between selectively controlled electrodes on opposite edges thereof.

3,603,306
SNORKEL
Richard J. Bonin, Jr., Los Alamitos, Calif., assignor to Under Sea Industries, Inc.
Continuation of application Ser. No. 679,846, Nov. 1, 1967, now abandoned. This application Apr. 9, 1970, Ser. No. 31,809
Int. Cl. A63b 7/00
U.S. Cl. 128—145 A 8 Claims



The improved snorkel (FIGS. 1–4) in contrast to the prior art snorkel (FIG. 5) is shaped and designed to fit closely to the face of the wearer whereby viscous drag is minimized. Unnecessary curves in the snorkel tube are eliminated whereby minimum resistance is encountered to water being purged from the snorkel by exhalation. The feathered edge (FIG. 3) also assists in this function.

3,603,307
INSTRUMENT FOR PRODUCING BREATHING ACTION ON THE LUNGS
Paul Bischler, Schuberstrasse 6, 775 Konstanz, Germany
Filed Mar. 25, 1969, Ser. No. 810,126
Claims priority, application Germany, Mar. 26, 1968, P 17 66 038.7
Int. Cl. A62b 7/02
U.S. Cl. 128—145.6 2 Claims



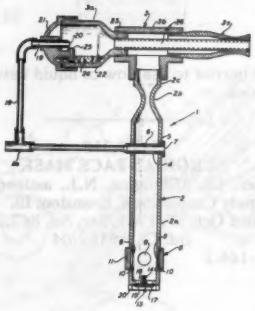
An externally controlled electromagnetic device for operating a valve mechanism to admit fresh air from an external source under pressure so as to control a supply of fresh air to an inspiration tube insertable into the trachea as far as the zone of the lung. An expiration tube is combined with the

said tube to permit escape of used air and also reaches to the lung zone. The instrument, essentially by the control of frequency of valve movement, allows a rate and amount of fresh gas flow suitable for the animal species under observation.

3,603,308
INTERMITTENT POSITIVE PRESSURE BREATHING DEVICE

Joseph W. Spradling, and John P. Kayser, both of Madison, Wis., assignors to Air Reduction Company, Incorporated, Murray Hill, N.J.

Filed July 15, 1968, Ser. No. 744,813
Int. Cl. A61m *7/02*
U.S. Cl. 128—145.8 **4 Claims**

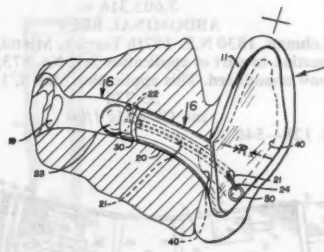


A hand-held respirator comprising a gas pressure source, exhaust port means and a plurality of tubular elements in a substantially tee shape with the leg of the tee having a pressure relief valve for patient exhalation to atmosphere, an air intake valve for controlling ambient air inflow, and inhalation and exhalation passages; with the head of the tee having a nebulizer at one end receiving gas from said pressure source therethrough for flow directly to the patient and a mouthpiece at the other end for passing gas from said source with air to the patient, the gas flow through the nebulizer and mouthpiece when the exhaust port means is closed being maintained distinct until reaching the patient.

3,603,309
EAR MOLD PROTECTOR

Fred Wesemann, 239 Villa Vista, Sterling, Colo.

Filed Oct. 14, 1969, Ser. No. 866,797
Int. Cl. A61f *11/02*
U.S. Cl. 128—152 **4 Claims**

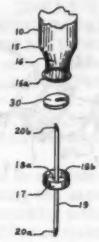


This invention relates to a new method of ear protection embodying a combined ear plug and protector, having a medicated salve sealant cavity, and made of resilient material and embodying a manually operable ball valve of the same material at the innermost end in the auditory canal extension thereof.

3,603,310
DISPOSABLE SYRINGE

Ralph E. Mottin, Grosse Pointe Park, and Carl C. Garland, Detroit, both of, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed June 30, 1969, Ser. No. 837,408
Int. Cl. A61m *05/22, 05/32*
U.S. Cl. 128—218 R **4 Claims**

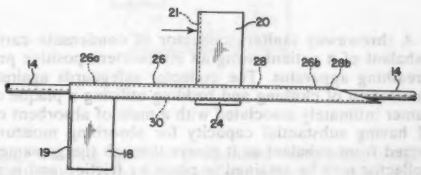


A dispensing syringe is provided having a liquid-fill compartment between an inner piston and an outer piston. In storage the inner piston is partly pierced by the inner end of a two-way syringe cannula and serves to divide the syringe barrel in two parts: one, a head space and the other the mentioned compartment separate from the syringe cannula. To avoid changes of pressure in the head space the hub has a bypass structure for venting. The syringe is operable by reciprocation to bring the liquid-fill in direct communication with the syringe cannula for mixing purposes, aspiration and injection by conventional techniques. The syringe components are standardized for use with conventional dispensing components such as vials, needle covers, etc. The head space has a closure hub on the free end thereof, the hub having a gasket in the form of a disc having a radial channel therein so that the head space may be vented to atmosphere in storage or when the inner piston is moved toward the hub for bringing the liquid-fill into communication with the cannula as noted.

3,603,311
SLIDING WEDGE-TYPE REMOVABLE GUIDE NEEDLE

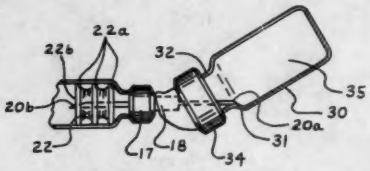
James A. Huggins, Racine, Wis., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 19, 1970, Ser. No. 12,647
Int. Cl. A61m *5/00, 5/14*
U.S. Cl. 128—214.4 **6 Claims**



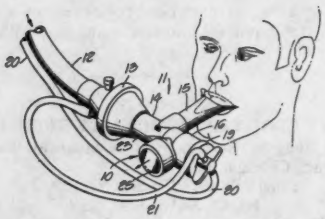
A hollow guide needle for piercing a body portion to position therein a flexible catheter for withdrawing or introducing fluids relative to the body portion, and which includes a hollow tube longitudinally slotted to provide frangible connecting webs between slots, and a wedge member slidably mounted on the tube and guided in the slots for forced longitudinal movement along the tube for severing the frangible webs to separate the tube into discrete sections which may then be completely removed from the body-inserted catheter.

3,603,312
DISPOSABLE DISPENSING SYRINGE VIAL
Paul A. Lucas, Webster, N.Y., and Ralph E. Mottin, Grosse Pointe Park, Mich., assignors to Parke, Davis & Company, Detroit, Mich.
Filed June 30, 1969, Ser. No. 837,693
Int. Cl. A61j *1/00*
U.S. Cl. 128—272 **4 Claims**



A disposable syringe vial is provided having closure means adapted to receive a syringe cannula in fluidtight engagement and to flex while in such engagement to selected positions for complete aspiration of liquid contents from the vial without operational loss of liquid.

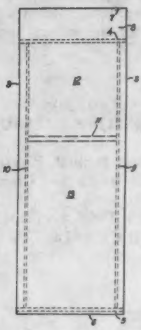
3,603,313
THROWAWAY CONDENSATE COLLECTOR
Dennis Arblaster, 34081 La Serena, Dana Point, Calif.
Filed Aug. 11, 1969, Ser. No. 849,072
Int. Cl. A61f *5/44*
U.S. Cl. 128—275 **9 Claims**



A throwaway sanitary collector of condensate carried in exhalant of a patient using an intermittent positive pressure breathing apparatus. The collector safeguards against contamination of clothing and bedding utilizing a plaque of gossamer intimately associated with a mass of absorbent material having substantial capacity for absorbing moisture collected from exhalant as it passes through the gossamer. The collector may be retained in place by friction and is readily replaceable by a fresh one.

3,603,314
DIAPER
Sven Ulrik Torbjorn Aberg, Molnlycke, Sweden, assignor to Molnlycke Aktiebolag, Gothenburg, Sweden
Filed Sept. 11, 1964, Ser. No. 395,765
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 **3 Claims**

The diaper consists of two outer supporting layers and an intermediate layer of absorbent material which is thick at the front portion and relatively thin at the rear portion and there

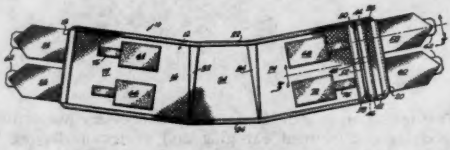


is a transverse barrier to the flow of liquid between said front and rear portions.

3,603,315
SURGICAL FACE MASK
Fred R. Becker, III, Millington, N.J., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Oct. 17, 1969, Ser. No. 867,296
Int. Cl. A61f *9/04*
U.S. Cl. 128—146.2 **7 Claims**

A surgical face mask is provided with an inner layer of soft polymeric foam material which is worn against the face. The mask includes an intermediate layer of filter material and an outer layer of nonwoven material which is relatively impervious to airborne bacteria. The soft foam layer increases the comfort of the mask and allows the mask to conform to the face of the wearer. Further, the foam layer readily absorbs perspiration and saliva and passes these fluids to the middle filter layer, thereby maintaining the layer adjacent the face soft and dry.

3,603,316
ABDOMINAL BELT
Ira S. Lehman, 1830 N.E. 197th Terrace, Miami, Fla.
Continuation-in-part of application Ser. No. 873,200, Nov. 3, 1969, now abandoned. This application May 8, 1970, Ser. No. 35,770
Int. Cl. A41c *1/00*
U.S. Cl. 128—546 **15 Claims**



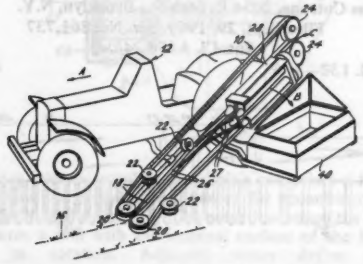
An abdominal belt of elastic material, to girdle a substantial portion of the midsection of a wearer to provide a limited

degree of primary pressure force to the entire area of contact with the body and secondary pressure forces to the abdominal region through elastic draw strips at both ends of the belt and a slot adjacent one of the belt ends whereby one of the draw strips is adapted to be pulled through the slot and across the abdominal region while the other strip is pulled in the opposite direction into an overlapping relationship of the outside surface of the abdominal belt.

3,603,317
POD REMOVAL APPARATUS

John Raymond Sharp, 15 High Street, Beadfordshire, Clophill, England

Filed Jan. 27, 1969, Ser. No. 793,988
Claims priority, application Great Britain, Jan. 29, 1968, 4543/68
Int. Cl. A01d
U.S. Cl. 130—30 **7 Claims**

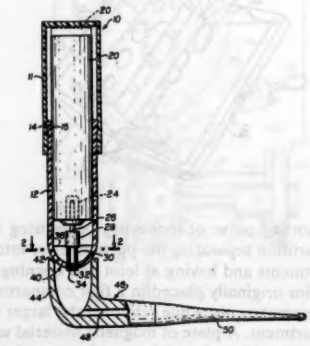


The invention includes an apparatus for removing pods from a plant e.g. a pea plant. In a preferred embodiment of the invention the apparatus comprises a gripping means which may be in the form of a pair of rollers or belts, control means for restricting the freedom of angular movement of pod bearing portions of the plant, and pod plucking means located adjacent the control means. The pod plucking means may be in the form of a pair of cooperating rollers, one longitudinally ribbed and the other with a plane cylindrical surface, whilst the control means may be provided by the gripping rollers or where gripping belts are used instead, by an additional control roller located between the belts and the plucking means. Driving means are also provided for driving the gripping means and the control means.

3,603,318
APPARATUS FOR CLEANING SMOKERS' PIPES

Alfred Yurdin, 10 Fenton Drive, Millburn, N.J.

Filed Jan. 17, 1969, Ser. No. 791,908
Int. Cl. A24f *09/04*
U.S. Cl. 131—244 **10 Claims**



Apparatus for cleaning a smoker's pipe by cleaning fluid sprayed from a nozzle under pressure as an aerosol spray. The open top of the bowl is covered and sealed by a head portion surrounding the nozzle and this causes the blast of cleaning fluid and its propellant, which is directed into the bowl of the pipe, to blow out through the stem of the pipe. The apparatus includes a pressurized can of cleaning fluid and propellant and a head portion with a soft sealing surface that is pressed against the rim of the pipe bowl. This pressure is used to actuate an automatic valve that controls the flow of fluid from the can.

3,603,319
FLAVOR-RELEASING SMOKING ARTICLE AND METHOD OF MAKING THE SAME

Charles E. Badgett, and Jerome S. Osmalov, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

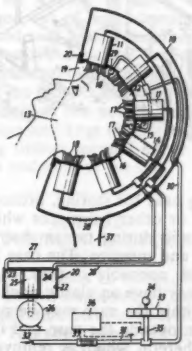
Filed Dec. 13, 1968, Ser. No. 783,743
Int. Cl. A24b *15/02;* **A24d** *01/06;* **A24f** *25/00*
U.S. Cl. 131—10.9 **7 Claims**

This disclosure relates to a flavor-releasing smoking article and to methods of making the same. More particularly, the disclosure relates to a smoking article embodying a filter for tobacco smoke, which filter contains, as an essential filtering element, a solid polymer having controlled pore size and containing therein a flavor for incorporation in tobacco smoke, said polymer being capable of removing undesirable elements from tobacco smoke while imparting desirable flavor thereto.

3,603,320
HAIR WASHING MACHINE

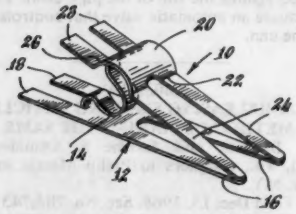
Guisseppe Guerino Vittorio Scipione, 14a. St. George's Drive S.W.1, London, England

Filed Feb. 27, 1969, Ser. No. 802,872
Claims priority, application Great Britain, Mar. 1, 1968, 10149/68
Int. Cl. A45d *7/00*
U.S. Cl. 132—7 **24 Claims**



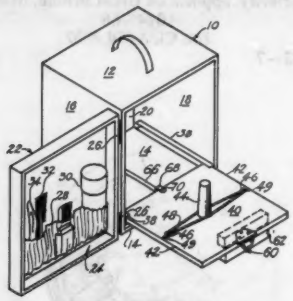
A hair washing machine is disclosed comprising a casing provided with a lining which defines a zone in which a person's head is intended to be received. The lining is rigid and supports a plurality of hair treatment units each including a hair treatment element reciprocable by means of a piston and cylinder assembly into and out of the head-receiving zone. The treatment elements take the form of groups of resiliently flexible fingers which spread outwardly on engagement with a person's head and thus perform a massaging action. The treatment units are operated by an air pump driven by a motor which also drives a camshaft having cams designed and arranged to cause water, shampoo and the like to be supplied to sprays contained within the lining. The camshaft also carries cams operable to cause the operations performed by the machine to be performed in a predetermined sequence.

3,603,321
ONE-PIECE CLIP
Douglas V. Viltrakis, 50 Watertown Road, Thomaston, Conn.
Filed June 24, 1969, Ser. No. 836,109
Int. Cl. A45d *18/24*
U.S. Cl. 132—48 4 Claims



There is disclosed a one-piece hair clip formed from a blank bent at its midportion into a double ogee spring. The ends of the blank extend from the spring in one direction and form cooperating jaws. Spaced extensions of the jaws extend from the spring in the opposite direction and form actuating handles.

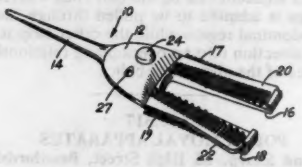
3,603,322
WIG CASE
Nancy C. Wilson, 2591 Ridgewood Rd. N.W., Atlanta, Ga.
Filed Nov. 13, 1968, Ser. No. 775,262
Int. Cl. A45d *40/00*
U.S. Cl. 132—79 F 6 Claims



A portable wig case for storing, protecting and transporting wigs, wiglets or other hairpieces which also serves as a support for the wig during certain hairdressing operations such as combing and spraying. The case is a normally closed compartment with openable closure, such as a small door thereon, which may have an elastic pocket therein. A sliding shelf mounted within the case may be pulled by hand to an extended position outside the case and the shelf has a small protruding pin thereon which is removably inserted in the bottom of styrofoam plastic head form on which the wig is supported in fashion much like that when it is worn on the head. Elastic holddowns keep the plastic form in place on the pin when traveling and may be stretched out of the way so that the form may be removed. A modification for a smaller hairpiece such as a wiglet includes a different sort of base removably mounted on the pin on the shelf and a smaller form which is held in place by an elastic stretch band encircling the top.

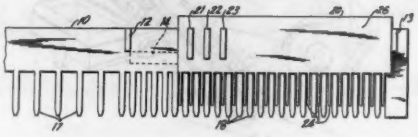
3,603,323
HAIR TREATING DEVICE
Guy Avella, 7975 Nordica, Niles, Ill.
Filed Aug. 27, 1969, Ser. No. 853,369
Int. Cl. A45d *24/04*
U.S. Cl. 132—131 7 Claims

A hair treating device for roughing or teasing hair to give it fullness which includes a body having movable inwardly facing comb members thereon which comb members are actuated toward one another by cam means readily manipulata-



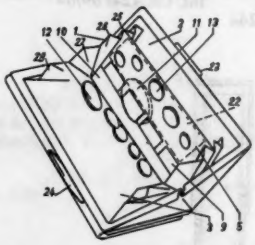
ble by the user. The comb members are biased apart from one another to permit release of the hair.

3,603,324
AUTOMATIC TEASING COMB
Nicholas Cutrone, 2054 E. 56th St., Brooklyn, N.Y.
Filed Sept. 29, 1969, Ser. No. 861,737
Int. Cl. A45d *24/04*
U.S. Cl. 132—136 4 Claims



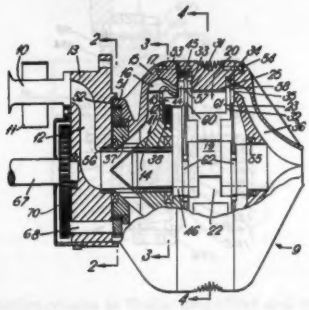
A first short comb having a channel-shaped body and a second longer comb removably assembled in the channel so that the teeth of the two combs are adjacent and so that the first comb may have lateral movement with respect to the second comb. Lateral movement provides for the opening and closing of the spaces between the adjacent teeth of the two combs so that hair strands may be gripped between the teeth for teasing the hair.

3,603,325
PURSE COMPRISING A SORTING MEMBER
Marinus Beerens, Kloosterweg 38, Waalwijk, Netherlands
Filed May 13, 1969, Ser. No. 824,072
Claims priority, application Netherlands, May 15, 1968, Nov. 29, 1968, 6,806,829;6,817,084
Int. Cl. G07d *3/00*
U.S. Cl. 133—3 22 Claims



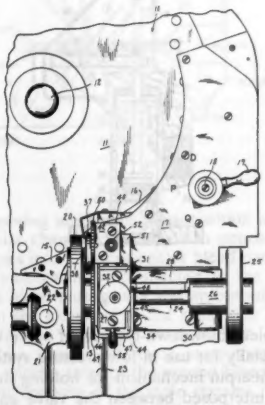
A coin-sorting purse or moneybag comprising at least one dividing partition separating the purse interior into a plurality of compartments and having at least one opening for passing smaller coins originally placed in a first compartment to succeeding compartments, while retaining the larger coins in the first compartment. A plate of magnetic material supported by the dividing partition above the openings in a later compartment exerts its magnetic force substantially exclusively in that compartment.

3,603,326
ROTARY INTERNAL COMBUSTION ENGINES
David Sadler Pearson, Derby, England, assignor to Rolls-Royce Limited, Derby, England
Filed Oct. 20, 1969, Ser. No. 867,743
Claims priority, application Great Britain, Oct. 29, 1968, 51,284/68
Int. Cl. F02b *53/08*; F01c *13/04*
U.S. Cl. 123—8.41 12 Claims



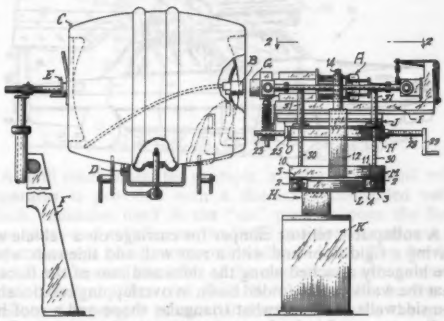
A rotary internal combustion engine comprises a housing within which there is a rotor mounted for eccentric rotation with respect to the housing. The rotor has vanes the tips of which form a seal with the internal surface of the housing during its rotation. Adjacent vanes define spaces therebetween so that a combustible mixture injected into the spaces if first compressed, ignited, and then exhausted during rotation of the rotor. The housing is also rotated in the same sense at the rotor and this reduces the relative velocity between the tips of the vanes and the internal surface of the housing.

3,603,327
JAM ELIMINATOR APPARATUS FOR COIN COUNTING MACHINES
Arnold R. Buchholz, and Charles T. Bergman, both of Watertown, Wis., assignors to Brandt Automatic Cashier Co., Watertown, Wis.
Filed Jan. 29, 1970, Ser. No. 6,896
Int. Cl. G07d *9/00*
U.S. Cl. 133—8 R 9 Claims



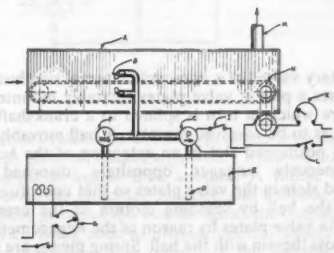
A helper wheel is disposed at the entrance to the exit passage of a coin counting machine in which a rotating disk forms coins into a single file and normally moves the file into the exit passage. The coins in the exit passage are engaged seriatim by a rotating ejector wheel which forces the coins past a star wheel connected to a counter and out a discharge chute. The ejector wheel is mounted on a driven shaft which is journaled in a tiltable support so that the ejector wheel may be moved away from the exit passage to halt the counting of coins. The helper wheel is supported on a bracket assembly which is mounted on the driven shaft and is also geared to the driven shaft. The helper wheel is tilted with the ejector wheel to be rendered operable to engage coins at the entrance and feed them to the ejector wheel, thereby preventing the jamming of coins at the entrance.

3,603,328
ADJUSTABLE SUPPORT FOR APPARATUS FOR CLEANING KEG FITTINGS OF TAPPING SYSTEMS
George C. Fenn, 87 Lake Trial East, Wayne, N.J.
Filed Feb. 9, 1970, Ser. No. 9,570
Int. Cl. B08b *3/04*, *9/02*
U.S. Cl. 134—43 10 Claims



Cleaning apparatus for a tapping system fitting secured in a keg that is held in predetermined position includes a nozzle that is mounted on a base to move longitudinally and horizontally into and out of liquid transmitting engagement with said fitting, and said base is mounted on a support on which is means to move said base vertically and means to move the base horizontally in angularly related directions, one parallel to and the other transversely of, said direction of longitudinal movement of the nozzle, to accommodate kegs of different diameters and kegs of different lengths and kegs having the tapping fittings located either concentrically or eccentrically of the end walls of the keg.

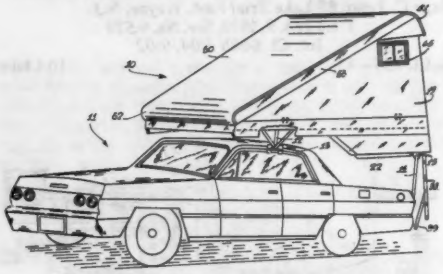
3,603,329
APPARATUS FOR MANUFACTURING PRINTED CIRCUITS
Robert B. White, and Charles L. Cooke, both of Huntsville, Ala., assignors to Brown Engineering Company, Inc.
Continuation of application Ser. No. 468,435, June 30, 1965, now abandoned. This application Nov. 6, 1968, Ser. No. 781,686
Int. Cl. B08b *3/02*
U.S. Cl. 134—107 4 Claims



Apparatus for obtaining a thin, smooth and evenly distributed layer of solder covering the entire conductive area

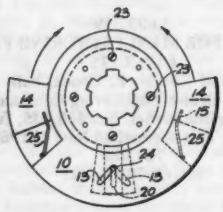
of a printed circuit board by passing a circuit board, in which the conductive area is coated with a layer of solder, through a spray of liquid heated to above the melting point of the solder.

3,603,330
COLLAPSIBLE TENT
Halldor K. Halldorson, 35 Somerville Rd., and Irving O. Nelson, 2055 Argyle St., both of Regina, Saskatchewan, Canada
Filed Jan. 27, 1969, Ser. No. 794,190
Claims priority, application Canada, Dec. 3, 1968, 36,741
Int. Cl. A45f *1/00*
U.S. Cl. 135—1 4 Claims



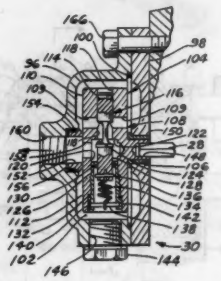
A collapsible tent or camper for carriage on a vehicle and having a rigid floor and with a rear wall and sidewalls which are hingedly attached along the sides and rear of the floor so that the walls can be folded down in overlapping relationship; the sidewalls of a somewhat triangular shape and a roof hingedly connected at its forward end to the front of the floor, the roof covering the sides in the collapsed condition and resting on the top edges of the walls in the erected position.

3,603,331
ROTARY VALVE
David E. Tanner, 1551 Price Rd., Youngstown, Ohio
Filed Feb. 10, 1970, Ser. No. 10,155
Int. Cl. G05d *13/14*; F16k *3/03*
U.S. Cl. 137—56 5 Claims



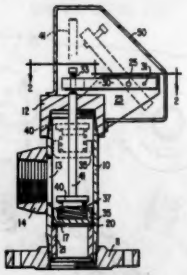
A rotary valve for a two-cycle internal combustion engine comprises a pair of valve plates rotatably mounted on a hub structure which in turn is splined to a crankshaft of the engine so as to be revolved thereby. A ball movably caged in a radially positioned slot in an extension of the hub structure simultaneously engages oppositely disposed angularly disposed slots in the valve plates so that centrifugal force imparted the ball by spinning motion of the crankshaft will move the valve plates by reason of the engagement of the angular slots therein with the ball. Spring means are provided to bias the valve plates to one position and centrifugal force and the ball move the valve plates to a second position responsive to said spinning motion of the crankshaft.

3,603,332
HYDRAULIC RESISTOR
Raymond P. Canale, Warren, Mich., assignor to Holley Carburetor Company, Warren, Mich.
Filed Dec. 11, 1968, Ser. No. 783,054
Int. Cl. G05d *13/10*
U.S. Cl. 137—56 8 Claims



A primary embodiment of the invention has a housing forming an interior chamber with an inlet and outlet formed therein; a rotatable resistor body situated within the chamber and rotatably driven by a shaft journaled in the housing has conduit means formed therein for completing communication between the interior chamber and outlet; a resiliently biased spoollike valve carried by the resistor body is centrifugally positioned so as to at a predetermined rotational speed of the resistor body terminate communication between the interior chamber and the outlet.

3,603,333
PRESSURE RELIEF VALVE
Carl M. Anderson, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Aug. 29, 1969, Ser. No. 854,082
Int. Cl. F16k *17/14*
U.S. Cl. 137—70 4 Claims



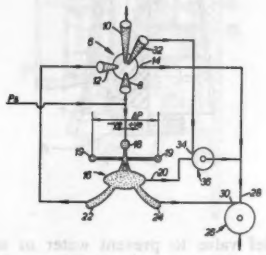
The complete blowdown-type relief valve disclosed is intended especially for use in low-pressure systems. The valve employs a shearpin mechanism for holding the valve closed. A spring is interposed between the valve and the shearpin mechanism and serves, prior to the shearing of the pin, to yieldingly force the valve into sealing engagement with the valve seat. This arrangement prevents fluttering movement or chattering of the valve and variable forces on the shearpin, due to fluctuations in the pressure against the valve.

3,603,334

FLUIDIC SYSTEMS

Guy E. Davies, Fareham, and Christopher G. S. Wilson, Cowplain, both of, England, assignors to The Plessey Company, Limited, Ilford, Essex, England

Filed Mar. 25, 1970, Ser. No. 22,454
Claims priority, application Great Britain, Mar. 25, 1969, 15476/69
Int. Cl. F15c *1/12, 1/16*
U.S. Cl. 137—81.5 7 Claims



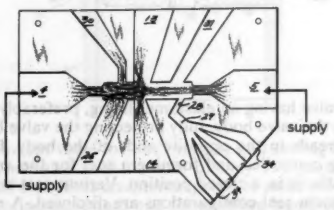
The invention relates to fluidic amplifiers and in particular to a system which improves the efficiency of the amplifier when operating at high pressures. The system includes a proportional amplifier which provides from one of its output legs, fluid to the supply control jet of a planar jet amplifier. The other output leg of the proportional amplifier feeds a vortex amplifier which in turn can vary the vent pressure of the planar jet amplifier. Therefore the pressure at the vent output is varied automatically as a function of the pressure at the control jet input and the supply jet input of the jet collector amplifier in a sense such as to extend the effective range of operation of the amplifier.

3,603,335

FLUIDIC LOGIC DEVICE WITH MONOSTABLE IMPACTING STREAM RESPONSE

Warren A. Lederman, and Charles N. Petrie, both of Milwaukee, Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Mar. 31, 1970, Ser. No. 24,306
Int. Cl. F15c *1/20*
U.S. Cl. 137—81.5 7 Claims



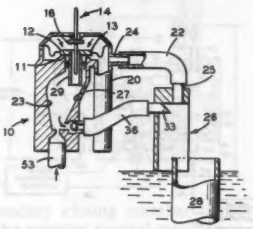
A pair of opposing airstreams impact within a two-dimensional rectangular chamber and establish oppositely flowing impacting streams into a pair of center bleed passageways. A control signal passageway is connected to the chamber to one side of one bleed passageway and an output passageway is connected to the chamber to the same side of the main streams and to the opposite side of the same bleed passageway. Main stream reference passageways are connected to the opposite sides of the second bleed passageway to the second or opposite of the main streams. The walls of the center bleed passageways adjacent the output passageway are planar lock-on walls to which the impacting streams attach and results in flow and pressure in the corresponding output passageway. The center bleed passageways are similarly formed except that the passageway between the output and control passageways has an aperture of a smaller area than the other bleed passageway. A control stream applied to the control passageway reduces the stream strength to shift the impact flow from the lock-on wall and remove the output.

3,603,336

FLUIDICALLY CONTROLLED REFILL MECHANISM WITH BACKFLOW PREVENTER

Barry S. Fichter, Dunellen, and Edward H. Bell, Clinton, both of, N.J., assignors to American Standard Inc., New York, N.Y.

Filed May 5, 1970, Ser. No. 34,679
Int. Cl. F15c *3/04*
U.S. Cl. 137—81.5 9 Claims



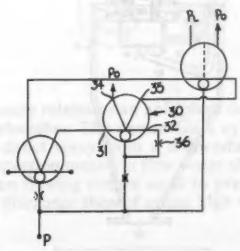
A refill mechanism, for example, a water closet tank refill apparatus is provided with a fluidically controlled valve which maintains itself in the "on" position once the fluid flow starts and switches to the "off" position in response to the attainment of a predetermined liquid level. The flowing fluid in the control chamber of the mechanism, acts as a wall or air barrier. When the fluid flow stops, the barrier is eliminated leaving a substantial distance between the maximum water height and the lowest "siphon" inlet to the valve, thereby preventing accidental backflow of water from the tank into the main waterline.

3,603,337

FLUIDIC SWITCHING CIRCUIT

Ronald Alfred Heath, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Sept. 17, 1969, Ser. No. 858,771
Claims priority, application Great Britain, Sept. 30, 1968, 46265
Int. Cl. F15c *1/12*
U.S. Cl. 137—81.5 6 Claims



The invention relates to a fluidic pressure-ratio switching circuit, which gives an output signal only when one of a pair of input signals is higher than another. A fluidic bistable device performs the switching function and a fluidic proportional amplifier provides the output signal, the outputs of the bistable device being used to provide control signals for the proportional amplifier. The output of the bistable device which causes the proportional amplifier to give the circuit output signal is connected to the appropriate control port of

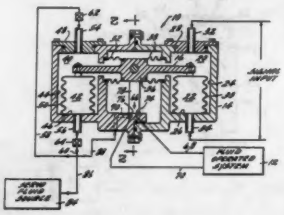
the amplifier via a further fluidic device which is monostable. The further device may either be inherently monostable or be a biased bistable device. It will in either case provide the appropriate control signal to the amplifier only when the corresponding output signal from the first bistable is present. The power inputs to all the devices are provided from a common source, those of the first bistable and the further device via flow restrictors.

3,603,338

GAIN-COMPENSATING CONTROL COMPONENT

Howard B. Kast, Fairfield, Ohio, and Bruce S. Buckley, Berkeley, Calif., assignors to General Electric Company

Filed Mar. 6, 1970, Ser. No. 17,187
Int. Cl. F15b *9/06;* **G05d** *16/00, 13/00*
U.S. Cl. 137—83 **7 Claims**



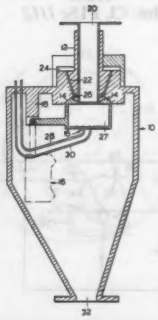
A fluid control component is disclosed which has gain inversely proportional to pressure level P_1. The resulting function yields the desired gain compensation for control systems involving pressure and pressure ratio sensing. The gain compensator comprises a force balance servo in which a damping device comprising a pair of opposed compartments are each supplied with pressure P_1 through a tight restrictor.

3,603,339

ONE-WAY VALVE WITH BUOYANCY ADJUSTMENT

Hugh David Swain, Kalulushi, Zambia, assignor to RST International Metals Limited

Filed Dec. 15, 1969, Ser. No. 885,111
Int. Cl. F16k *31/22, 51/00*
U.S. Cl. 137—240 **6 Claims**



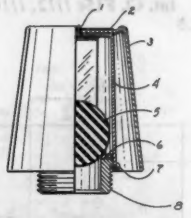
A one-way valve for controlling the flow of abrasive liquids is provided which consists of a pivoted closure member and a valve seat against which the closure member may seal. The closure member is formed by an enclosed chamber and means are provided for alternately filling the enclosed chamber with air to cause the closure member to become buoyant and with water to cause the closure member to sink in the abrasive liquid being handled.

3,603,340

DRAIN RELIEF VALVE

Leroy H. Rousselet, 2745 N. Central Expressway, Dallas, Tex.

Filed June 24, 1969, Ser. No. 836,180
Int. Cl. F16l *5/02;* **F16k** *15/04*
U.S. Cl. 137—357 **6 Claims**



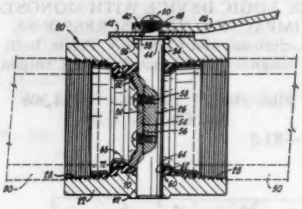
A drain relief valve to prevent water or sewage from backing up into a house or other building and overflowing plumbing fixtures resulting from a clogged drain comprising, a one-way valve attached to the drain exteriorly of the building having a ball therein which is moved off the seat by increased fluid pressure in the drain pipe resulting from a clogged drain to allow excess fluid to flow through the one-way valve exteriorly of the house or building.

3,603,341

LINED DISC VALVE AND MOLD FOR FORMING THE LINING

Domer Scaramucci, 3245 S. Hattie, Oklahoma City, Okla.

Filed Feb. 24, 1970, Ser. No. 13,701
Int. Cl. F16k *1/22, 27/12*
U.S. Cl. 137—375 **12 Claims**



A disc valve having an elastomer lining, preferably molded in place in the valve body, fully protecting the valve body, including threads in the opposite ends of the body, from the fluid being controlled and forming a seat for the valve disc when the disc is in a closed position. Various seat configurations and stem seal configurations are disclosed. A multiple-piece mold for forming the lining is also disclosed.

3,603,342

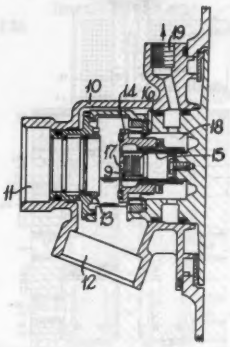
LEVEL CONTROL ARRANGEMENTS FOR FUEL TANKS

Harry Simister Bottoms, Olton, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

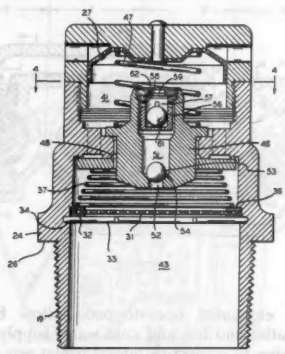
Filed June 5, 1969, Ser. No. 830,798
Int. Cl. F16k *31/34*
U.S. Cl. 137—414 **2 Claims**

An arrangement for controlling the level of fluid in a tank has a main valve whose closure member is displaced towards its seat by the combined effect of a fluid pressure and a spring. This fluid pressure is vented by means of a pilot valve to open the main valve. The pilot valve is itself operated by a float in the tank. The closure member of the pilot valve is spring loaded towards the pilot valve seat, and the arrange-

ment is such that pressure tending to shut the main valve also tends to displace the pilot valve closure member from its associated seat. The rate of closure of the main valve is thus reduced, with a consequent reduction in the hydraulic hammer effects experienced in known valves.



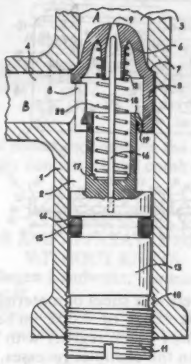
3,603,343
DRUM VENT VALVE
Nicholas W. Keller, Chicago, Ill., assignor to Justrite Mfg. Co., Chicago, Ill.
Filed Aug. 25, 1969, Ser. No. 852,744
Int. Cl. F16k *17/26*
U.S. Cl. 137—493.6 **8 Claims**



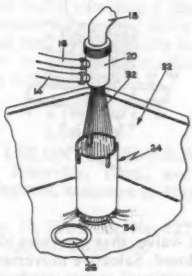
A drum vent valve for both venting and sealing fluid-filled drums. The valve shell consists of only two parts, and the valve itself comprises an internal pressure relief valve portion for preventing explosions and for enabling bleeding of excess pressure caused by minor temperature differentials. At the same time, an oppositely acting external pressure relief valve acts to vent the drum when removing fluids therefrom.

3,603,344
IMPROVEMENTS IN AND RELATING TO AN APPARATUS FOR ADJUSTING A FLUID THROUGHPUT
Harald Stampfli, Geneva, Switzerland, assignor to Lucifer S. A., Carouge-Geneva, Switzerland
Filed Oct. 7, 1969, Ser. No. 864,468
Claims priority, application Switzerland, Oct. 31, 1969, 16272/68
Int. Cl. F16k *15/00*
U.S. Cl. 137—513.3 **3 Claims**

The valve provides an unrestricted flow through a chamber from a first opening to a second opening while the reverse flow is first adjusted to a fine extent so as to allow a gradual increase in flow until full throughput is reached. To this end a large primary closing member engages the first opening so as to be urged off its seat under the action of the fluid entering said opening whereas the opposite flow seats said primary closing member. For this opposite flow, a control member causes a secondary closing member constituted by a rod coaxial with the primary control member to recede out of a port formed in the primary member. When said rod has receded sufficiently and allowed a sufficient throughput, it draws along with it the primary closing member which leads to the desired full throughput in said opposite direction.



3,603,345
ANTISPLASH DEVICE
Joseph J. Verwys, 941 Ellsmere, N. E., Grand Rapids, Mich.
Filed Jan. 21, 1969, Ser. No. 792,671
Int. Cl. E03c *1/18*
U.S. Cl. 137—582 **5 Claims**

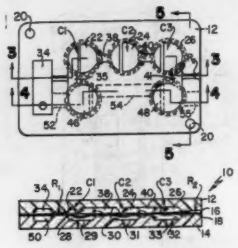


This disclosure relates to an antisplash device for use with a portable dishwasher. The device has a cylindrical member to receive a direct spray from a dishwasher discharge in a sink and a dispersion means to flow water along the sink bottom in an even flowing stream so as to prevent splashing of water during discharge thereof under high velocity from the dishwasher.

3,603,346
PNEUMATIC LOGIC ELEMENT
Alfred Hirt, East Greenwich, R.I., assignor to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.
Filed Sept. 5, 1969, Ser. No. 855,536
Int. Cl. F16k *31/145;* **F16j** *3/00*
U.S. Cl. 137—608 **6 Claims**

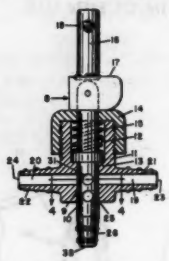
The disclosure of the invention is a diaphragm-type pneumatic logic element having two formed plates mounted in facing relation with complementary pairs of chamber recesses and interconnecting channel recesses formed in the

facing surfaces of said plates, and a flexible diaphragm bonded to the facing surface of each plate excepting only a narrow area surrounding each chamber recess which is left unbonded. The improvement consists of a diaphragm support interposed between the diaphragms. The diaphragm support



is a thin but relatively stiff sheet of material, preferably beryllium copper in the order of 0.002 inches thick, which is formed with apertures which register with and are of slightly larger diameter than the chamber recesses, but of less diameter than the usual unbonded area between the diaphragm and plate surrounding each chamber recess.

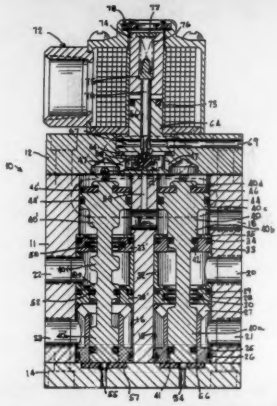
3,603,347
FULL FLOW WITH SHUTOFF AND SELECTIVE DRAINAGE CONTROL VALVE
Joseph J. Paolini, 103 Adams St., Newton, Mass.
Filed Aug. 5, 1969, Ser. No. 847,596
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.17 **6 Claims**



A multiorifice valve that provides different patterns of fluid flow is disclosed. Selective movement of a valve stem in both axial and rotational senses produces various combinations of alignment between transverse bores in the valve stem and multiple orifices in a valve body.

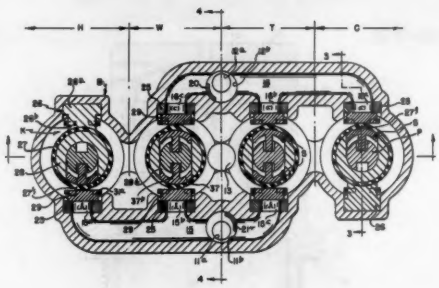
3,603,348
VALVE IMPROVEMENTS
Lee A. Wright, Kettering, Ohio, assignor to Mosier Industries, Inc.
Filed July 31, 1969, Ser. No. 846,479
Int. Cl. F16k *11/10*
U.S. Cl. 137—625.64 **9 Claims**

The valve housing includes a bore in which a valve spool is reciprocally mounted. A pilot and vent port communicates with such bore at one of its ends; an inlet port communicates with such bore intermediate its ends. The valve spool includes a head which reciprocates between the aforesaid ports. Such head includes an annular groove in which a ring of low-friction material is mounted, this ring forming a partial seal with the aforesaid bore thereby to control the pressure differential or drop across the piston head of the valve spool. The valve includes one or more O-rings which seat against an annular formation including a tapered wall designed to



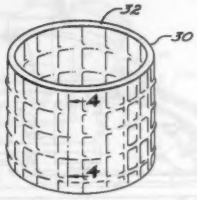
minimize frictional engagement between such wall and the O-ring.

3,603,349
PUSHBUTTON-OPERATED VALVE
Irlin H. Botnick, 3155 Kersdale Rd., Pepper Pike, Ohio
Filed Aug. 14, 1969, Ser. No. 850,017
Int. Cl. F16k *19/00*
U.S. Cl. 137—636.1 **16 Claims**



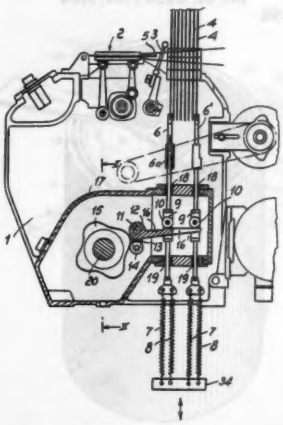
For an elongated open-topped hollow body with a discharge outlet and hot and cold water supply connections each branching to respective lateral triplet sets of inlet ports opening into the body as a mixing chamber through hard smooth-faced port rings, in diametric hot and cold pairs at the intermediate locations and single hot and cold ports respectively near the body ends, a molded plastic support element integrally provides a body cover plate and four inwardly extending guiding cylinders for actuating pistons camming slide members in radial slideways of the support element toward respective inlet ports. Through a molded elastomeric diaphragm member enveloping the inwardly projecting portion of the support element and having a peripheral flange clamped between and gwsketing the body and cover, the slide members resiliently engage hard lapped port-controlling ceramic disks, supported in caging rings as valving members cooperatively opposite respective inlet port rings. Above the cover plate is supported an array of four pushbutton rocker arms pin-and-slot engaged with the pistons. Plug valves respectively throttling hot supply to one and cold supply to the other intermediate port pairs preset two mixed flow temperatures, with four water temperatures thus available upon respective button selection in the flow determined by extent of pushbutton depression.

3,603,350
REINFORCED ELASTIC MATERIAL AND METHODS OF MANUFACTURE
Edwin P. Monroe, 255 Barrett Rd., Berea, Ohio
Filed Nov. 21, 1968, Ser. No. 777,857
Int. Cl. F16l 11/08
U.S. Cl. 138—126 3 Claims



There is disclosed herein an inflatable elastic boot having an open mesh net reinforcement limiting and controlling the expansion of the boot under pressure; and methods of manufacture comprising rotating a drum in baths of uncured elastic material, wrapping the drum with the net between baths, and curing the elastic material.

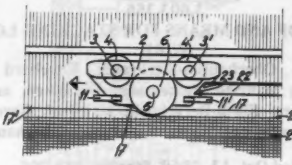
3,603,351
DOBBY FOR LOOMS
Giovanni Piazzolla, Via Salieri 6, Milan, and Carlo Villa, Via Mazzini, 43, Melzo, both of, Italy
Filed Mar. 5, 1969, Ser. No. 804,454
Claims priority, application Italy, Mar. 6, 1968, 13593 A/68
Int. Cl. D03c 5/00, 13/00
U.S. Cl. 139—79 7 Claims



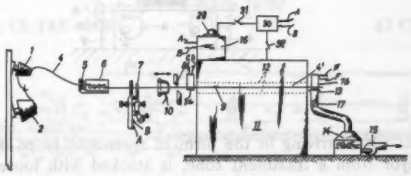
A high-speed dobby with heddles which are moved in one direction by means of a springs and in the opposite direction by means of a cam and lever assembly.

3,603,352
CARRIAGE FOR INSERTING AND TIGHTENING WEFT YARNS
Ramon Balaquer Golobart, Calle Valls y Taberner, 11, Barcelona, Spain
Filed Dec. 8, 1969, Ser. No. 882,858
Int. Cl. D03d 47/14, 47/16
U.S. Cl. 139—122 R 6 Claims

A device for inserting weft yarns into the shed of a loom comprises a flat base having a rotatable grooved wheel for guiding the yarn through the shed while pushing the previously laid yarn into locking position in the warp yarns by means of a pair of rollers mounted on the opposite side of the base which rollingly contact a fixed comb on the loom.

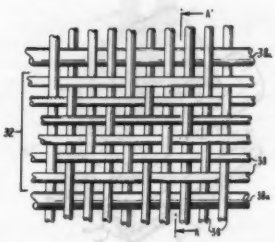


3,603,353
METHOD OF AND APPARATUS FOR WEAVING WITHOUT KNOTS
Eduard Glass, Solingen-Landwehr, Germany, assignor to Etag Textilwerke GmbH
Filed Feb. 26, 1969, Ser. No. 802,432
Claims priority, application Switzerland, Feb. 28, 1968, 2878/68
Int. Cl. D03d 51/34
U.S. Cl. 139—370 15 Claims



A weaving machine employs apparatus for detecting knots or abnormal thicknesses of weft yarn during the weaving process and apparatus for severing faulty lengths of weft yarn after insertion of the faulty yarn into a shed formed by the warp yarn and apparatus for shutting down operation of the weaving machine and removing the faulty length of weft yarn from the shed prior to setting the machine to repeat the weave and restarting the machine.

3,603,354
APPARATUS FOR USE ON PAPERMAKING MACHINES
Charles Allen Lee, Knoxville, Tenn., and Joseph Robert Wagner, Leeds, England, assignors to Huyck Corporation, Stamford, Conn.
Filed Apr. 10, 1968, Ser. No. 727,125
Int. Cl. D03d 1/00
U.S. Cl. 139—383 7 Claims



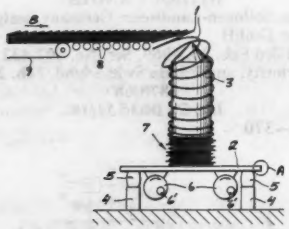
This invention relates to an improved papermakers' fabric for use in the press section of a papermaking machine and more specifically to a papermakers' fabric having a plurality of spaced, parallel, substantially incompressible grooves in at least one surface thereof, which provide void volume for

water expressed from a paper web as it passes through the pressure nip of the press rolls in the machine.

3,603,355
METHOD OF AND MEANS FOR STACKING LOOPED WIRE

Hans Geipel, Oberhausen-Sterkrade; Eckehard Forster, Oberhausen; Wilfried Heinemann, Dinslaken, and Nikhil Roychoudhury, Essen-Bergeborbeck, all of, Germany, assignors to Huttenwerk Oberhausen AG., Oberhausen, Germany

Filed Oct. 13, 1969, Ser. No. 866,796
Claims priority, application Germany, Oct. 17, 1968, P 18 03 697.0
Int. Cl. B21f *3/04*
U.S. Cl. 140—2 **8 Claims**

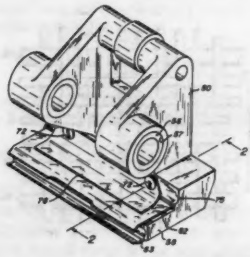


Steel wire, arriving in the form of spreadout loops on a conveyor from a treatment zone, is stacked with loose fit around an upstanding mandrel or within an upwardly open receptacle mounted on a vibratile platform to form a compact coil with mutually staggered turns, the oscillations of the platform having a frequency on the order of 10 cycles per second (substantially corresponding to the rate of deposition of wire loops) and of an amplitude with a horizontal component about equal to or greater than the wire thickness.

3,603,356
GRIP TRANSFER ARM

Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J.

Filed Oct. 22, 1969, Ser. No. 868,416
Int. Cl. B21f *45/00*
U.S. Cl. 140—75 **7 Claims**

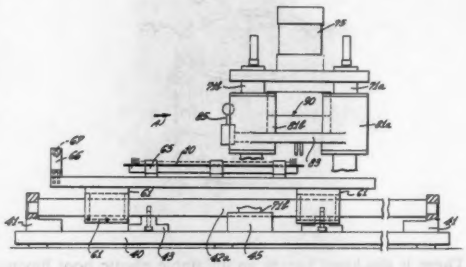


A grip transfer arm as used in apparatus for applying plastic grips to wire bail handles is provided with improved tubing grip-plates. This improved grip transfer arm provides grip-plate retaining means adapted to permit a damaged grip-plate to be replaced without disassembly of the apparatus.

3,603,357
BACKWIRING

Peter R. Drummond, 4257 Neosho Ave., Culver City, Calif.

Filed July 10, 1968, Ser. No. 743,904
Int. Cl. B21f *1/02*
U.S. Cl. 140—147 **20 Claims**

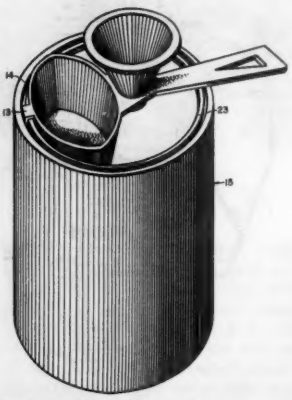


A method for straightening connector pins is disclosed as a preparatory measure for the stringing of wires between the pins. The pins are first anchored in a mounting board which is run subsequently through a pin straightening machine. The pins, when bent, are individually deflected to assume the desired position, and they are twisted around the respective axis defining that desired position, beyond the elastic limit for torsional deformation.

3,603,358
EQUIPMENT FOR DISPENSING LIQUIDS FROM A CONTAINER

James L. Mallindine, 923 Orange St., Greenville, Mich.

Filed Oct. 22, 1969, Ser. No. 868,409
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—98 **3 Claims**



A scoop and a funnel for use in conjunction with a container, with the scoop adapted to rest across the container opening while supporting the funnel in position for drainage back into the container.

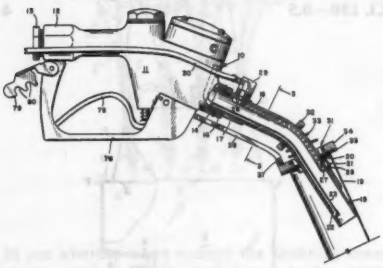
3,603,359
AUTOMATIC TRIP SAFETY FILL NOZZLE

Fred M. Belue, Kernersville, N.C., assignor to Gilbert & Barker Manufacturing Company, New York, N.Y.

Filed Oct. 17, 1968, Ser. No. 768,392
Int. Cl. B65b *1/30*
U.S. Cl. 141—208 **7 Claims**

A safety automatic trip fluid dispensing nozzle for cooperatively sealing a tank fill pipe to prevent fluid slashage and vapor emission in which a valve mechanism with an operating linkage is preconditioned for valve mechanism

operation upon fill pipe sealing and for valve mechanism deactuation upon unseating intentionally or inadvertently or

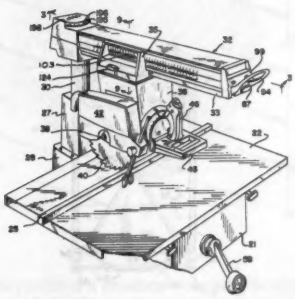


upon increased fill pipe pressure transmitted to the dispensing nozzle beyond a predetermined pressure level.

3,603,360
RADIAL ARM SAW

Harold R. Botefuhr, Bensenville, Ill., assignor to G. W. Murphy Industries, Inc.

Division of Ser. No. 594,084, Nov. 14, 1966, Patent No. 3,482,610. Filed Aug. 13, 1969, Ser. No. 849,731
Int. Cl. B27b *5/20*
U.S. Cl. 143—6 A **4 Claims**



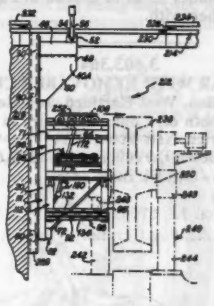
A radial arm saw is provided with a column having a radial arm for supporting a motor driven saw over a work surface. A housing for the motor-driven saw is provided with a brake and actuator means for adjusting the housing, and accordingly the saw, about a horizontal axis whereby very accurate angled cuts can be provided. Adjustment means are also provided for the housing about the vertical axis for additional saw orientation adjustments.

3,603,361
BANDSAW CATCHER DEVICE

Howard N. Douglas, 550 Vandenberg Circle, Roseville, Calif.

Filed Feb. 2, 1970, Ser. No. 7,775
Int. Cl. B27b *13/00*
U.S. Cl. 143—28 **9 Claims**

Roller means mounted on a bandsaw catcher and operable to lift a bandsaw positioned thereon above the periphery of

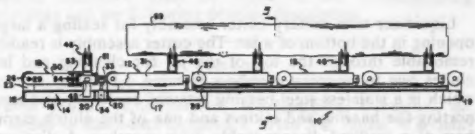


the adjacent upper mill wheel to facilitate the transfer of the bandsaw to the mill wheel.

3,603,362
LOG CARRIAGE APPARATUS

Peter J. Neild, North Vancouver, British Columbia, Canada, assignor to MacMillan Bloedel Limited, Vancouver, British Columbia, Canada

Filed May 6, 1968, Ser. No. 726,996
Int. Cl. B27b *29/08*
U.S. Cl. 143—105 **12 Claims**

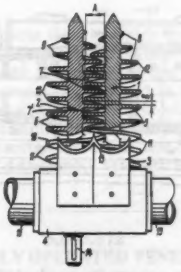


Apparatus for gripping and transporting logs past cutting elements for accurate cutting thereof. The apparatus grips and holds each log in a substantially horizontal plane, the gripping taking place along the lower portion of the log so that cutting elements, such as saws and/or chipper heads, can cut the log from above on both sides.

3,603,363
ROOT CROP HAULM CUTTER

Boris Moiseevich Frankshtein, ulitsa Yablochkova, 31, kv. 44, Moscow, U.S.S.R.

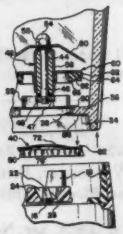
Filed Apr. 14, 1969, Ser. No. 815,667
Int. Cl. A23n *15/04*
U.S. Cl. 146—85 **4 Claims**



A root crop haulm cutter comprises a body carrying a pair of augers for rotation in opposite directions with the blades of the augers overlapped and interpenetrated with one another with clearance. A knife is fixed on the body and extends into adjacent relation with the augers at the outer periphery of the blades and the knife has a cutting edge con-

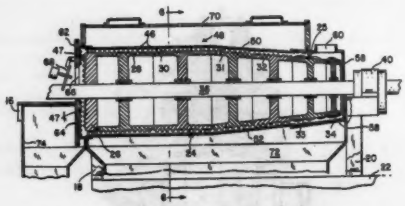
fronting the augers and curved to conform to the outer periphery of the blades so as to extend in adjoining circumferential relation therewith.

3,603,364
LIQUIDIZER JAR WITH REMOVABLE CUTTER UNIT
Maurice P. Samuelian, West Hartford, and George E. Sachse, Jr., Northfield, both of, Conn., assignors to Dynamics Corporation of America, New York, N.Y.
Filed Oct. 29, 1969, Ser. No. 872,032
Int. Cl. B02c *18/12*
U.S. Cl. 146—68 A **14 Claims**



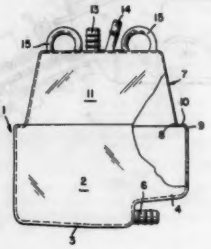
Liquidizer with unitary cutter assembly for sealing a large opening in the bottom of a jar. The cutter assembly is readily removable through the top of the jar for cleaning and includes two telescoping members forming a housing, one of which is a stainless-steel-bearing retainer enclosing and supporting the bearing and cutters and one of the clutch members of a resilient disengageable drive member. A disc nut receivable over the driven clutch member in working position releasably engages the hub of the housing to draw the stainless steel bearing retainer downwardly resiliently to seal the large opening with a self-centering gasket molded marginally to the retainer engaging a narrow flange bordering the opening.

3,603,365
DEGERMINATOR
Roscoe M. Bess, Paris, Ill., assignor to Illinois Cereal Mills, Inc., Paris, Ill.
Filed Feb. 6, 1970, Ser. No. 9,330
Int. Cl. B02b *3/06*
U.S. Cl. 146—279 **10 Claims**



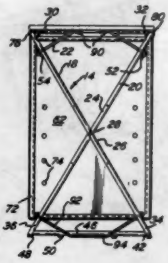
A degerminating machine having a screen casing within which a degerminating roll is rotatably mounted. The roll has a plurality of teats on its outer periphery with the teats aligned in helical rows extending along the length of the degerminating portion of the roll. Corn kernels fed into the machine at one end are cracked by the teats and the germs and fines are passed through the screen while the coarse starch material is discharged from the other end thereof.

3,603,366
COLLAPSIBLE DRAINAGE BOTTLE
Peter J. Albizati, Myersville; Samson Asin, Westfield; Alfred B. Beers, New Providence; Thomas A. Child, Basking Ridge, and Mario L. Giangrande, Madison, all of, N.J., assignors to C. R. Bard Inc., Murray Hill, N.J.
Filed June 17, 1969, Ser. No. 833,927
Int. Cl. B65d *1/02*; **A61j** *1/00*
U.S. Cl. 150—0.5 **4 Claims**



A bedside drainage bottle so constructed that the upper half, including an inlet connection, can be telescoped or collapsed into the lower half to constitute a tray in which tubing or other articles may be placed or stored, the upper half rising readily to expanded position to accommodate liquid drained into the bottle. An air vent may be provided in the top and a closable outlet may be provided in the bottom.

3,603,367
COLLAPSIBLE HAMPER
David Lehrman, Cheltenham, Pa., assignor to The Ironees Company, Philadelphia, Pa.
Filed July 23, 1969, Ser. No. 844,013
Int. Cl. B65d *33/00*
U.S. Cl. 150—49 **11 Claims**

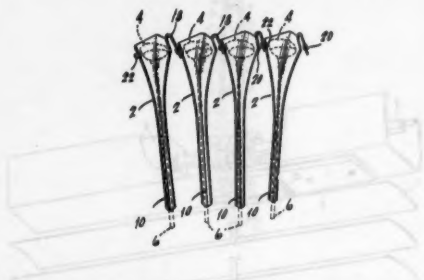


A collapsible hamper is disclosed wherein a collapsible and foldable frame supports a receptacle of flexible sheet material. The frame, in one presently preferred form, includes a pair of central leg portions pivotably interconnected at medial points thereon, and removable upper and lower leg portions. The upper leg portions engage the receptacle and support a cover for the receptacle. The lower leg portions are adapted to engage a support surface to support the entire hamper in an upright position.

3,603,368
GOLF CLUB PROTECTOR
William C. Brenner, 42 Westcott Ave., Trenton, N.J.
Filed Nov. 4, 1969, Ser. No. 873,882
Int. Cl. B65d *65/02*
U.S. Cl. 150—52 G **5 Claims**

Individual covers for golf clubs are simply, securely and effectively connected to a golf bag and have enlarged open ended portions for receiving the head of the clubs and tubular extensions through which the shafts of the clubs are in-

serted. The enlarged portions of the covers are provided with closure means or flaps which extend over the heads of the clubs and are held closed by fastening means when the clubs



are not in use whereas when opened the fastening means on the closures permit the individual covers to be connected together into a unitary assembly and serve to hold the covers open to permit ready removal and insertion of the clubs.

3,603,369

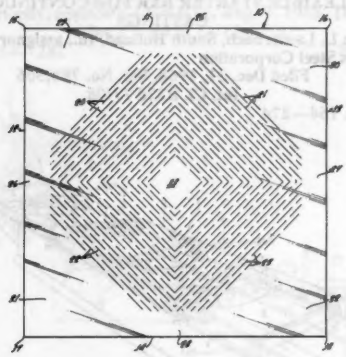
PRODUCE WRAPPER

William A. Scholz, Ontario, Canada, assignor to Standun, Inc., Compton, Calif.

Filed July 2, 1969, Ser. No. 844,725

Int. Cl. B65d *65/10*

U.S. Cl. 150—52 R **6 Claims**



This invention provides a produce-wrapping device formed by a square sheet of pliable, transparent plastic having sets of rows of slits inwardly of the marginal edges, two of the sets of slits being in opposite quarters of the sheet and parallel to one diagonal, while the other two sets of slits are in the opposite quarters of the sheet and parallel to the other diagonal, whereby, when the corners of the sheet are brought around a quantity of produce and tied, the produce is retained and the slits in the sheet are caused to open up and provide ventilation.

3,603,370

PNEUMATIC TIRE

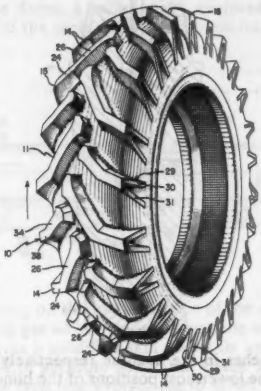
Edgar W. Hylbert, Akron, Ohio; Bernd F. O. Tomaszewski, Kuenzell, Germany; Jacob Kleywegt, Arlon, Belgium, and Hans Dietl, Colmar Berg, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 28, 1969, Ser. No. 880,555

Int. Cl. B60c *11/08*

U.S. Cl. 152—209 **7 Claims**

A rear tractor tire having a tread with alternating long and short lugs on each side, each long lug having an inner portion extending at a low angle with respect to the midcircumferential centerline of the tread and an outer portion extending at a high angle with respect to said circumferential centerline, and each short lug being disposed at a high angle with respect to said midcircumferential centerline.



The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawings and the following detailed description.

3,603,371

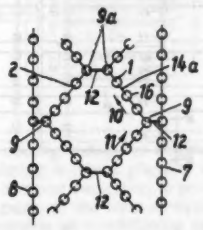
ANTISKID AND TIRE PROTECTIVE CHAINS

Anton Muller, Unterkochen, Wurttemberg, Germany, assignor to Eisen-und Drahtwerk Erlau AG, Aalen, Wurttemberg, Germany

Continuation-in-part of application Ser. No. 535,306, Mar. 11, 1966, now abandoned. This application Dec. 3, 1968, Ser. No. 784,531

Int. Cl. B60c *27/07*; **F16g** *13/00*

U.S. Cl. 152—239 **14 Claims**



Skid chain for vehicle tires in which strands of chain are arranged in zigzag paths in that portion of the skid chain which extends over the thread of the tire with the deviating points of the chain strands connected to each other and to lateral members at the sides of the skid chain. Double hooks are provided for fastening and detaching with respect to chain links interconnected thereby. These hooks are open for quick assembly and disassembly yet sufficiently restricted for resilient interfit.

3,603,372

ELECTRICALLY OPERATED VENETIAN BLIND

Werner Dietzsch, Oldenburg, Germany, assignor to Firma Justin Huppe, Oldenburg, Germany

Filed Feb. 28, 1969, Ser. No. 803,210

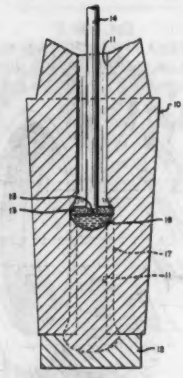
Claims priority, application Germany, Sept. 18, 1968, H 63830

Int. Cl. E06b *9/30*

U.S. Cl. 160—168 **8 Claims**

An electrically operated slatted or Venetian blind including a headrail in which the motor and other electric com-

ponents are mounted. The electric components are interconnected by plug and socket connections for easy replacement.



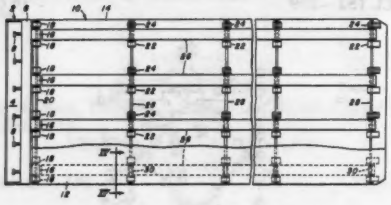
Two limit switches in the headrail respectively limit the uppermost and the lowermost positions of the blind.

3,603,373

PROTECTIVE COVER FOR GUIDE PATHS OF MACHINE TOOLS

Kurt Loos, Dreistiefental, and Friedrich Haschek, Huttental-Weidenau, both of, Germany, assignors to Kabelschlepp GmbH, Siegen, Germany

Filed Mar. 4, 1968, Ser. No. 710,386
Claims priority, application Germany, Mar. 4, 1967, K 61 592
Int. Cl. E05d *15/06*
U.S. Cl. 160—202 4 Claims



A protective cover for guide paths of machine tools, which comprises a plurality of overlapping and telescopically movable cover sheets, and rolling and slide means, respectively. Each of the cover sheets are supported at a front end wall by means of the rolling and slide means, respectively, on the corresponding of the guide paths and at the rear end on the next smaller of the cover sheets, and a speed-reducing braking device is disposed between the cover sheets, and becomes effective during movement from each other and into each other shortly prior to the prevailing end position.

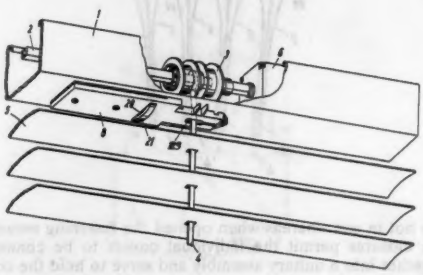
3,603,374

METHODS OF PRODUCING LARGE STEEL INGOTS

Lloyd R. Cooper, Pittsburgh, Pa., assignor to Heppenstall Company

Filed Feb. 10, 1969, Ser. No. 797,944
Int. Cl. B22d *27/02*
U.S. Cl. 164—52 3 Claims

A method of producing large steel ingots is provided combining the steps of pouring an ingot in the conventional manner, solidifying the same, removing an axial core lengthwise of said ingot to form a central cavity and filling the cavity with metal from an electrode by electroslag remelting.

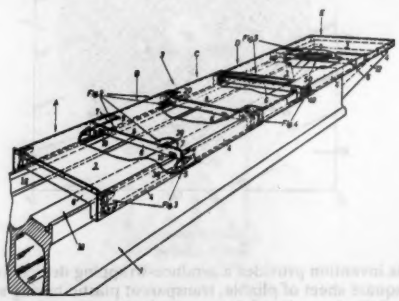


3,603,375

FLEXIBLE STARTER BAR FOR CONTINUOUS CASTINGS

William L. Lauterbach, South Holland, Ill., assignor to United States Steel Corporation

Filed Dec. 31, 1968, Ser. No. 788,306
Int. Cl. B22d *11/08*
U.S. Cl. 164—274 3 Claims



The flexible starter bar of the invention comprises a rigid head portion hingedly connected with an elongated flexible body portion. The body portion is comprised of continuous top and bottom flat thin steel plates connected together by transversely extending spaced tie rods which pass through spaced lugs welded to the inner faces of the flat steel plates. The flat steel plates are spaced apart by pairs of superposed narrow bars longitudinally aligned between pairs of the lugs. Adjoining faces of the spacer bars have mating machined slots aligned with slotted holes in the lugs to accommodate the tie rods.

3,603,376

APPARATUS FOR BENDING CONTINUOUS CAST SLABS

Kurt Reinfeld, and Emmanuel V. Gouye, both of Pittsburgh, Pa., assignors to Koppers Company, Inc.

Filed Apr. 4, 1969, Ser. No. 813,464
Int. Cl. B22d *11/08*
U.S. Cl. 164—274 8 Claims

A starting bar with a unique head portion is connected to a

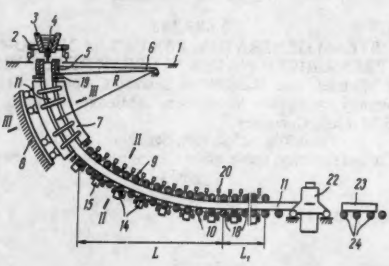
continuous cast slab, and the bar-head portion coacts with a unique roller apron to effect bending of the continuous cast slab from the vertical toward the horizontal position.

3,603,377

CURVILINEAR MOLD AND SECONDARY COOLING SYSTEM FOR CONTINUOUSLY CAST METAL

Georgy Lukich Khimich, ulitsa Lenina, 53, kv. 92, Sverdlovsk; Vitaly Maximovich Niskovskikh, ulitsa Festivalnaya, 21, kv. 60, Sverdlovsk; Alexei Ivanovich Varaxin, ulitsa Dybenko, 22, korpus 5, kv. 375, Moscow; Evgeny Jukhimovich Gelfenbein, ulitsa 40 Let Oktyabrya, 28, kv. 51, Sverdlovsk, and Vladimir Alexandrovich Bykov, ulitsa Khmeleva, 12, kv. 24, Sverdlovsk, all of, U.S.S.R.

Filed Aug. 9, 1966, Ser. No. 571,305
Claims priority, application U.S.S.R., Aug. 9, 1965, 1021693
Int. Cl. B22d *11/12*
U.S. Cl. 164—282 8 Claims



A plant for continuously casting metal including an oscillating curvilinear mold. Adjacent the curvilinear mold and defining a further curvilinear path exists a system for secondary cooling. The secondary cooling system comprises a series of curvilinear walking bars for maintaining the desired shape of the billet and for pulling the ingot from the mold. Adjacent the bars exist two rows of rollers above and below the path of the billet, the rollers defining the curvilinear path of the billet such that the radius of curvature becomes increasingly continuously greater to an infinite value. There then may be a rectilinear path of rollers, followed by a cutting device for cutting the continuous billet into usable lengths.

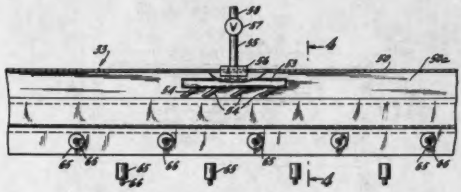
3,603,378

CONTINUOUS CASTING WITH CIRCULAR TROUGH MOLD

Douglas C. Yearley, Westfield, N.J., assignor to Phelps Dodge Copper Products Corporation, New York, N.Y.

Filed June 21, 1967, Ser. No. 647,680
Int. Cl. B22d *11/12*
U.S. Cl. 164—283 6 Claims

A generally horizontal annular trough forming a circular mold cavity is rotated about a generally vertical axis to transfer molten metal from a feeding station through a solidifying zone and thence through a discharge station where the solidified metal is continuously removed from the mold. The solidifying zone is formed by a cooling station including means for continuously cooling the trough to solidify molten metal in the mold, and a hood overlying at least part of the cooling station forms a substantially enclosed space above the open top of the mold. This space contains nozzle means for concentrating on the upper surface of the metal a stream of nonoxidizing gas which, prior to complete solidification of the metal, forms a solidified skin across its upper surface to prevent escape of gas from within the metal. Thus, when the metal is of the type that evolves gas to offset shrinkage during solidification, the upper surface of the solidified casting is flat rather than concave.

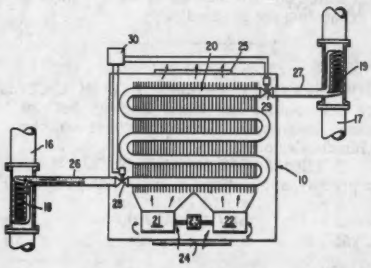


3,603,379

HEATING AND COOLING SYSTEM

Louis H. Leonard, Jr., Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 8, 1969, Ser. No. 814,293
Int. Cl. F25b *13/00*; F28d *15/00*
U.S. Cl. 165—2 7 Claims



A heating and cooling system for controlling the temperature of air circulating within a plurality of separate areas, located within a common enclosure, to provide comfort conditioning to occupants of the areas comprising a plurality of independently operable air-conditioning apparatus including heat-transfer means located within each of the areas, means to circulate air to be supplied to the area over said heat-transfer means in heat-transfer relation with the refrigerant of said apparatus and control means operable to vary the temperature of the air circulating over the heat-transfer means to obtain desired thermal effects. A hot water circulating loop and a cold water circulating loop are provided, the refrigerant passing in heat-transfer relation with the hot water when heating the air and passing in heat transfer relation with the cold water when cooling the air.

3,603,380

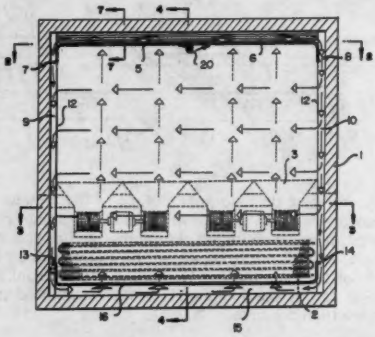
GAS DISTRIBUTION SYSTEM FOR EFFECTING HEAT EXCHANGE

Sabastien S. Corhanidis, 28 Carolou St., Athens, 107, Greece

Filed June 9, 1969, Ser. No. 831,401
Claims priority, application Greece, June 14, 1968, May 29, 1969, 34376;8449
Int. Cl. F25b *13/00*
U.S. Cl. 165—2 40 Claims

This disclosure provides a distribution system including a method and apparatus for effecting heat exchange between a

gaseous medium and a charge of material. The charge of material is placed in a heat-exchange zone at a location which provides a circulation space around the entire charge. The supply of heat-exchange gas medium is introduced into the gas circulation space at a location adjacent the charge. The gas medium is cycled in a continuous flow throughout the charge of material. A substantially uniform exchange effect is obtained by providing suitable supply and exhaust



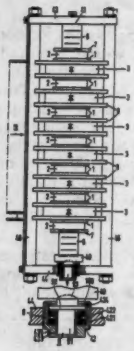
opening structures to effect equalization of the quantity of gas passing through and affected by the pressure drop in circulation spaces, turbulences, conversion of velocity pressure into static pressure, etc. The system of this disclosure includes an apparatus to effect the method of heat exchange. A specific embodiment of the apparatus includes adjustable structures which control the size of the openings for supplying and exhausting the gas medium.

3,603,381

LIQUID-COOLED ASSEMBLY OF DISC CELLS

Friedrich Scherbaum, and Klaus Ludwig, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 18, 1970, Ser. No. 20,699
Claims priority, application Germany, Mar. 22, 1969, P 19 14 790.1
Int. Cl. F28f *7/00*
U.S. Cl. 165—80 **10 Claims**



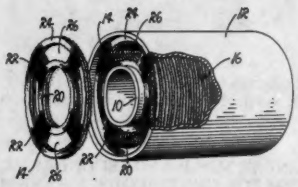
Assembly includes a stack of members having at least one disc cell with a coolant member coordinated therewith and at least one insulating member, and a force-storing member clamping the members of the stack between two opposing bearings of a framework, the disc cell including a cooling pan having a hollow inner space, a channel member having means for supplying thereto and discharging therefrom a liquid coolant, the channel member being located adjacent the cooling pan, so as to close off the inner space of the cooling pan, and sealing means disposed intermediate the cooling pan and the channel member, the force-storing device having such a biasing force as to form a liquidtight force fit between the cooling pan and the channel member.

3,603,382

RADIAL HEAT FLUX TRANSFORMER

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Robert J. Buzzard, Palo Alto, and Algerd Basiulis, Redondo Beach, both of, Calif.

Filed Nov. 3, 1969, Ser. No. 873,260
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 **2 Claims**



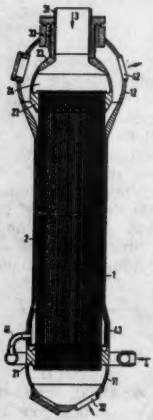
A radial heat flux transformer adapted to be employed in the transfer of thermal energy, particularly suited for use in delivering energy radially and characterized by two concentric cylinders interconnected by a network of groups of radially extended capillary channels having vapor spaces defined therebetween, a particular feature of the transformer being the capability of radially delivering vapor as well as its condensate in opposite radial directions between the concentric cylinders, whereby the device may be employed interchangeably as a flux concentrator or a flux radiator.

3,603,383

STEAM GENERATOR, PARTICULARLY FOR PRESSURIZED WATER NUCLEAR REACTORS

Horst Michael, and Hans-Peter Schabert, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

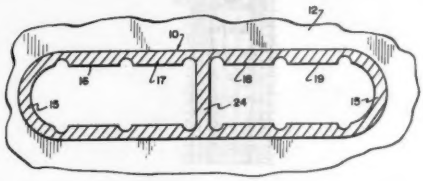
Filed Mar. 25, 1968, Ser. No. 715,617
Claims priority, application Germany, Mar. 25, 1967, S109023
Int. Cl. F28f *9/02*
U.S. Cl. 165—158 **6 Claims**



Steam generator particularly for pressurized water reactors includes an elongated pressure vessel, a bundle of heat exchanger tubes located in the vessel and extending substantially parallel to one another in the longitudinal direction of

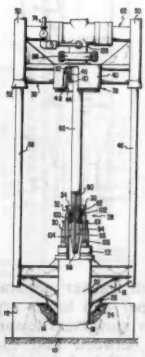
the vessel, and a pair of spaced-apart tube support plates mounted in the vessel and formed with recesses wherein respective ends of the tubes extend. The tubes are spaced from one another a distance that is only a fraction of the diameter thereof, and have a reduced diameter over a length thereof of several decimeters adjacent the tube support plates.

3,603,384
EXPANDABLE TUBE, AND HEAT EXCHANGER
Homer D. Huggins, and Jack C. Dudley, both of Racine, Wis., assignors to Modine Manufacturing Company
Filed Apr. 8, 1969, Ser. No. 814,401
Int. Cl. F28d *7/00*
U.S. Cl. 165—181 **4 Claims**



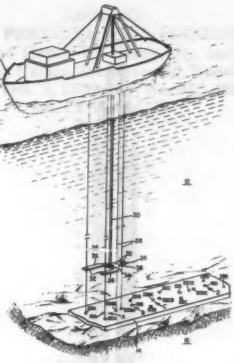
An expandable tube comprising a bendable body that includes a plurality of adjacent longitudinal passages each having adjacent longitudinal sections positioned inwardly of the tube interior, each section preferably having adjacent edges positioned inwardly with respect to the tube and hinge means at adjacent edges for expansion of the tube body at the hinge means under internal pressure without substantial lateral distortion of the individual sections between the hinge means. A heat exchanger comprising a heat conducting fin having an opening therein of noncircular configuration and a tube of similar noncircular cross section expanded to fit snugly into the opening in which the tube has the structure set out above.

3,603,385
METHOD AND APPARATUS FOR REMOVABLY COUPLING A BLOWOUT PREVENTER STACK TO AN UNDERWATER WELLHEAD CASING
Durward B. Jones, Houston, Tex., assignor to Offshore Systems Inc., Houston, Tex.
Filed Feb. 4, 1969, Ser. No. 796,357
Int. Cl. E21b *33/035*
U.S. Cl. 166—.5 **16 Claims**



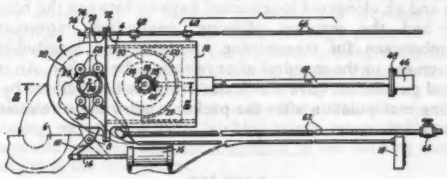
Use of an elongated, tapered and apertured guide tool extending beneath a blowout preventer stack for sealable insertion into an existing underwater wellhead casing to control final descent and placement of the blowout preventer stack collet connector in coupling position relative to the wellhead casing.

3,603,386
SUBSEA GUIDELINE ANCHORING METHOD AND APPARATUS
William A. Talley, Jr., Dallas, Tex., assignor to Mobil Oil Corporation
Filed Sept. 17, 1969, Ser. No. 858,661
Int. Cl. E21b *33/035, 43/01*
U.S. Cl. 166—.5 **13 Claims**



A method and an apparatus for locating and anchoring bottom-to-surface guidelines of a subsea guidance and alignment system to be utilized in conjunction with servicing or drilling subaqueous wells by lowering a pair of self-anchoring ends of unanchored guidelines on a spacer frame which is guided to the subaqueous bottom on a pair of previously anchored guidelines. The free guidelines are anchored upon contact of the self-anchoring ends with predetermined anchorage locations on the subaqueous bottom. The operation may be repeated to anchor other guidelines at other anchorage locations on the subaqueous bottom by utilizing the initially free and subsequently anchored guidelines as guides for lowering the space frame carrying the self-anchoring ends of other free guidelines.

3,603,387
BLOWOUT GUILLOTINE
William N. Schoeffler, Carencro, La. 70520
Filed May 19, 1970, Ser. No. 38,654
Int. Cl. E21b *29/00*
U.S. Cl. 166—55 **9 Claims**



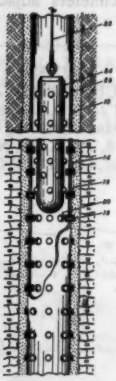
A hinged housing can be opened and then closed around a well casing with a tight seal. A rotary cutter disc is slidably mounted in the housing and operates to cut through the well casing within the housing and to polish the upper end of that part of the severed casing extending into the well. Hydraulic means are then actuated to press a face of the cutter disc against the polished end of the casing to positively close and seal the well.

3,603,388
RETRIEVABLE WELL PACKER
James H. Current; Harry C. Ehlert, and Marion D. Kilgore, all of Houston, Tex., assignors to Camco, Inc., Houston, Tex.
Filed Feb. 4, 1970, Ser. No. 8,468
Int. Cl. E21b *23/06, 23/04, 33/128*
U.S. Cl. 166—120 23 Claims

A longitudinally releasably retrievable well packer with a packing seal member surrounding a mandrel having a body slidably engaging the mandrel and a housing slidable relative to the body and the mandrel with releasable engaging means between the housing and he mandrel, and a longitudinally actuated releasably locking means connected to the housing for unlocking and locking the releasable engaging means and coacting means between the body and the locking means for actuating the locking means thereby providing a packer release assembly unaffected by packer seal tightness or upward forces on the tubing below the packer which allows tandem packers to be released one at a time. A shearpin movable in an annular and a longitudinal slot between the body and the housing for releasing the packer by an upward force or by a combination of rotation and upward force. A key and an elongated longitudinal keyway between the body and the housing allowing longitudinal movement therebetween and a key and an elongated longitudinal keyway between the housing and the mandrel allowing longitudinal movement therebetween for transmitting rotational and longitudinal movement to the mandrel after releasing the packer. An integral circulation valve which can be opened and closed by a tubing manipulation after the packer is set without releasing the packer.

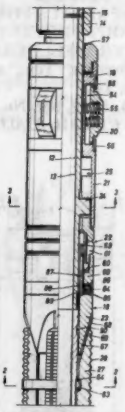
3,603,389
WELL LINER
Albert E. Campbell, Taft, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed May 28, 1970, Ser. No. 41,387
Int. Cl. E21b *37/00, 43/08*
U.S. Cl. 166—171 4 Claims

A well liner for use in lining a well penetrating a producing formation and formed from an elongated tubular member having a plurality of spaced-apart holes formed therein with a pin having a diameter less than the diameter of the hole extending through each of the holes with a head section on each end of the pin larger than the hole to maintain the pins



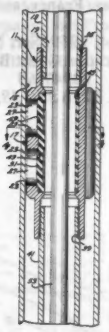
loosely fitting in the holes. A tool is provided for use in moving the pins to clean the liner.

3,603,390
FLUID PRESSURE-RESPONSIVE WELL PACKER
Howard L. McGill, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Division of Ser. No. 722,912, Apr. 22, 1968, Patent No. 3,516,493. Filed Sept. 15, 1969, Ser. No. 870,919
Int. Cl. E21b *33/12, 33/128*
U.S. Cl. 166—196 4 Claims



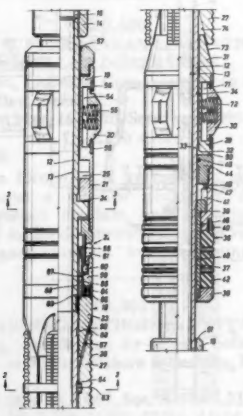
A retrievable well packer apparatus including a body member having upper and lower expander means slidably mounted thereon for movement toward and away from each other, slip means between said expander members and slidably coupled to said body member and one of said expander means, and packing means for sealing off a well bore in response to movement of said body member relative to slip and expander means in one longitudinal direction, said packing means including elastomeric packing elements and pressure responsive parts subject to fluid pressure acting in the opposite longitudinal direction for exerting compressive force on said packing elements.

3,603,391
TUBING ANCHOR
Jack Yann, 1539 Harbor, Long Beach, Calif.
Filed Apr. 3, 1970, Ser. No. 25,395
Int. Cl. E21b *23/00*
U.S. Cl. 166—212 3 Claims



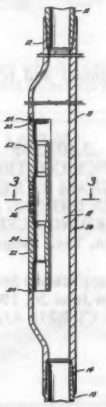
A tubing anchor for anchoring the lower extremity of a string of oil well tubing to a well casing. The anchor includes a hollow cage formed with a longitudinal passage having transversely opening windows formed therein. Sliders are disposed in the windows are slidable from a retracted position in said windows to an extended position projecting from said windows for engagement with the surrounding casing. A flexible boot lines the interior wall of the passage and is adhered to the interior wall of the passage and also to the back surfaces of the sliders. The boot has sufficient stiffness to normally maintain the sliders retracted within the windows and has sufficient flexibility to enable the pressure buildup within such boot as a consequence of a predetermined head of liquid in the tubing to flex such boot outwardly in the area of such windows to move the sliders to their extended position for engagement with the casing surrounding the tubing to maintain the tubing anchored firmly with respect thereto.

3,603,392
WELL PACKER ANCHOR
Howard L. McGill, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Division of Ser. No. 722,912, Apr. 22, 1968, Patent No. 3,516,493. Filed Sept. 15, 1969, Ser. No. 871,197
Int. Cl. E21b *23/06*
U.S. Cl. 166—216 3 Claims



A retrievable well-packer apparatus including a body member having upper and lower expander means slidably mounted thereon for movement toward and away from each other, slip means between said expander members and slidably coupled to said body member and one of said expander means, and packing means for sealing off a well bore in response to movement of said body member relative to slip and expander means in one longitudinal direction, said packing means including elastomeric packing elements and pressure responsive parts subject to fluid pressure acting in the opposite longitudinal direction for exerting compressive force on said packing elements.

3,603,393
HIGH PRESSURE WELL MANDREL
Ben D. Terral, and Henry W. Hardy, Jr., both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.
Filed Oct. 3, 1969, Ser. No. 863,498
Int. Cl. F04f *1/20*
U.S. Cl. 166—242 7 Claims

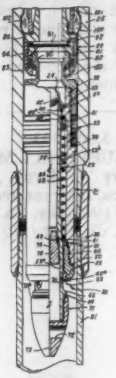


A high pressure mandrel for use in a well tubing having an open bore for alignment with the well tubing and including a valve side pocket housing having an internal tubular valve pocket in which the bore is substantially circular in cross section and the valve pocket housing is welded to the mandrel body by axially extended seams which are laterally offset from the axis of the bore of the body a distance no greater acted upon the radius of the bore thereby reducing the total area acted upon by internal pressures and increasing the capability of the mandrel to withstand high pressures. The mass of the material in the valve pocket housing being sufficient to prevent warping of the valve pocket when the housing is welded to the body thereby allowing the housing to be finished before being welded to the body. The valve pocket housing including a valve latching clamp integrally formed therewith insuring accurate alignment of the latching clamp relative to the side pocket.

3,603,394
WELL TOOLS
George Max Raulins, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.
Filed Feb. 19, 1970, Ser. No. 12,605
Int. Cl. E21b *33/00*; F16k *17/00*
U.S. Cl. 166—224 14 Claims

A combination standing valve and safety valve for a tubing string of a well including a ball valve which closes responsive to flow in the tubing string toward a well formation and a tu-

bular valve which responds to predetermined flow conditions to close to prevent flow from the formation into the tubing



string. The valve is installed and retrieved by wire line or pumpdown procedures.

3,603,395

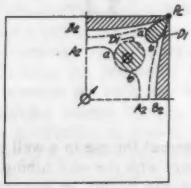
INTERFACE ADVANCE CONTROL IN SECONDARY RECOVERY PROGRAM BY RESHAPING OF THE INTERFACE BETWEEN DRIVING AND DRIVEN FLUIDS AND BY RETARDING CUSP FORMATION

Donald L. Hoyt, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 786,565, Dec. 24, 1968. This application June 30, 1969, Ser. No. 837,783

Int. Cl. E21b *43/22*

U.S. Cl. 166—245 **14 Claims**



The interface between driving and driven fluids in a secondary recovery operation is reshaped after a cusp has developed by injection of fluids via control wells to delay the arrival of the injected driving fluid into the vicinity of a production well, and by retarding cusp formation via wells controlling the advance of flow gradients to spread the interface.

3,603,396

METHOD FOR INCREASING SUBTERRANEAN FORMATION PERMEABILITY

Philip H. Braun, Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Dec. 15, 1969, Ser. No. 885,343

Int. Cl. E21b *43/25*

U.S. Cl. 166—261 **4 Claims**

A method for increasing the permeability of an already hydrated clay or shale subterranean formation by at least partially dehydrating at least a portion of the formation by heating or injection of a dehydrating liquid or gas, contacting at least part of the dehydrated portion of the formation with a material which hinders rehydration of the formation and thereafter exposing the formation to water.

3,603,397

INTRINSIC MOBILITY CONTROL IN PETROLEUM RECOVERY

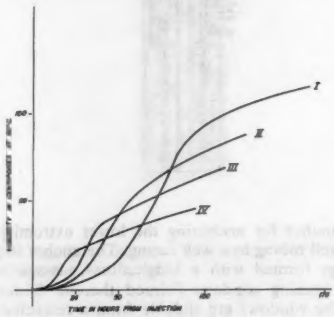
Jean-Marie Peray, Epinay, France, assignor to W. R. Grace & Co., New York, N.Y.

Filed May 14, 1969, Ser. No. 824,506

Claims priority, application Great Britain, May 14, 1968, 22947/68

Int. Cl. E21b *33/138, 43/22*

U.S. Cl. 166—270 **17 Claims**



An improvement in the process of polymer flooding for the secondary recovery of crude oil or sometimes gas in which the polymer is formed underground from injected monomer and a polymer flood whose mobility shows a downward gradient towards the extraction well is provided. Agents for control of intrinsic mobility other than polymers may be formed; the creation of a mobility control agent capable of further change can be used for purposes other than flooding, such as plugging connate water or gas.

3,603,398

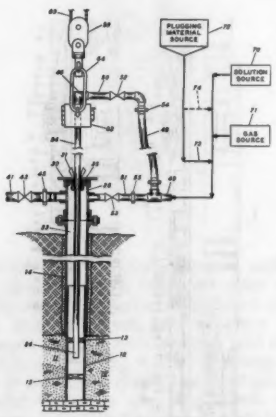
METHOD OF PLACING PARTICULATE MATERIAL IN AN EARTH FORMATION WITH FOAM

Stanley O. Hutchison, Bakersfield, and John C. McKinnell, Taft, both of, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed July 1, 1969, Ser. No. 838,082

Int. Cl. E21b *43/04, 43/27, 33/138*

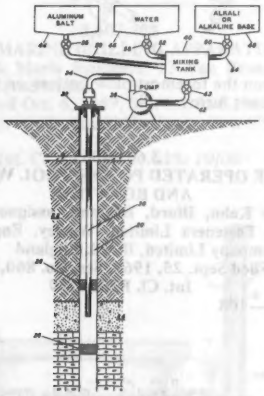
U.S. Cl. 166—305 **1 Claim**



A method for placing material in an earth formation penetrated by a well by carrying such material down the well

in a gas-liquid foam and moving said foam and material into a desired location in the earth formation.

3,603,399
FORMATION PERMEABILITY MAINTENANCE WITH HYDROXY-ALUMINUM SOLUTIONS
Marion G. Reed, Hacienda Heights, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Nov. 10, 1969, Ser. No. 875,026
Int. Cl. E21b *43/25*
U.S. Cl. 166—305 R **5 Claims**



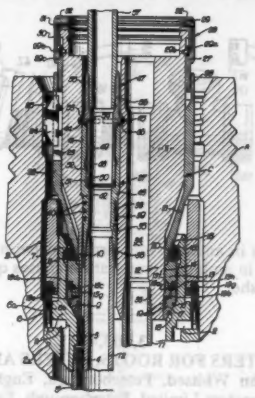
The disclosure provides a method of treating a water-sensitive formation penetrated by a well by contacting the formation with a hydroxy-aluminum solution having a ratio of the hydroxyl groups to the aluminum atoms in the range of from 1.5 to 2.7.

3,603,400
FRACTURING SUBTERRANEAN FORMATIONS USING MICELLAR DISPERSIONS
Marion O. Son, Jr., Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio
Filed Mar. 16, 1970, Ser. No. 20,099
Int. Cl. E21b *43/26*
U.S. Cl. 166—308 **19 Claims**

A subterranean formation is fractured by injecting under fracturing pressures a micellar dispersion comprised of hydrocarbon, aqueous medium, and surfactant. Propping agents are useful in the dispersion. Also, the viscosity of the dispersion is designed to obtain "low penetrating fluids."

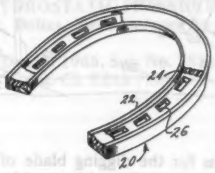
3,603,401
TUBING HANGING METHOD AND APPARATUS
Bobby H. Nelson, and Benton F. Baugh, both of Houston, Tex., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.
Filed Oct. 22, 1969, Ser. No. 868,319
Int. Cl. E21b *23/00, 33/03, 43/14*
U.S. Cl. 166—313 **26 Claims**

Tubing hanging method and apparatus in which a tubing hanger body supports a first string of well tubing in a well head assembly, and a second string of tubing is thereafter landed and releasably locked in position in the tubing hanger



by means of a running tool which enables pressure testing of the second tubing string and its removal, if desired.

3,603,402
HORSESHOE AND METHODS FOR SHOEING A HORSE THEREWITH
Robert McDonnell, P.O. Box 55, Ridge, N.Y.
Filed Mar. 20, 1969, Ser. No. 808,817
Int. Cl. A01l *03/00, 05/00, 07/02*
U.S. Cl. 168—4 **9 Claims**

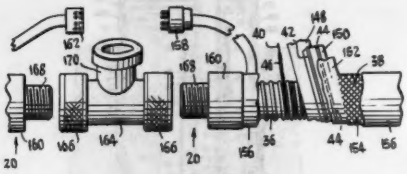


A horseshoe molded of a high impact polycarbonate resin attachable to a hoof either by nails through preformed openings in the horseshoe, or by a high impact polycarbonate resin cement. For the latter purpose, the horseshoe is formed with a groove on each of its side faces adjacent its hoof-contacting face for receiving and guiding a cutting nippers for severing the shoe from the hoof. The horseshoe may be provided with partially overlapping bars extending from each end thereof, at its opening, one of said bars having spaced holes formed therein and the other of said bars having a pin projecting therefrom engageable in a selected one of the holes.

3,603,403
AUTOMATIC FIRE EXTINGUISHING APPARATUS
Elwood R. Horwinski, Chesire, Conn., assignor to Lewis Engineering Company, Naugatuck, Conn.
Filed Aug. 20, 1969, Ser. No. 851,624
Int. Cl. A62c *35/00*
U.S. Cl. 169—5 **15 Claims**

Automatic Fire Extinguishing Apparatus which is independent of commercial utilities such as water supply, electrical service and the like, comprising a local pressurized source of extinguishing fluid and a plurality of flexible distribution hoses having sets of nozzles, said hoses also having detecting electrical conductors which respond to heat and which are connected to responsive power equipment controlling valves for releasing the extinguishing fluid under conditions of fire.

The conductors and responsive power equipment include heat insulation providing a special delay action by which normal changes in ambient temperature have no effect whereas a quick rise in ambient temperature causes quick response of the extinguisher.



3,603,404

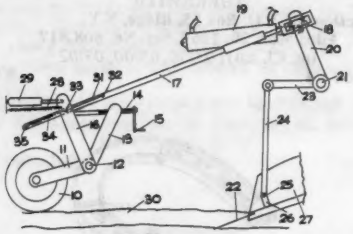
HARVESTERS FOR ROOTS, TUBERS AND THE LIKE

William John Whitsed, Peterborough, England, assignor to Root Harvesters Limited, Peterborough, England

Continuation of application Ser. No. 677,536, Oct. 24, 1967, now abandoned. This application May 15, 1970, Ser. No. 37,827

Int. Cl. A01d *21/02*

U.S. Cl. 171—9 **9 Claims**



Control means for the digging blade of a root crop harvester comprising means for raising and lowering the digging blade in relation to the harvester frame, a feeler device movable up and down to engage the soil surface and sense the level thereof, a fluid pressure operated device for raising and lowering the blade and valve means associated with the fluid pressure operated device actuated in one sense by the up and down movements of the feeler device and in an opposite sense by up and down adjusting movements of the digging blade whereby the blade is maintained at a desired depth of penetration of the soil.

3,603,405

DEVICE FOR AUTOMATICALLY LANDING A SEMI-INTEGRAL MOLDBOARD PLOW

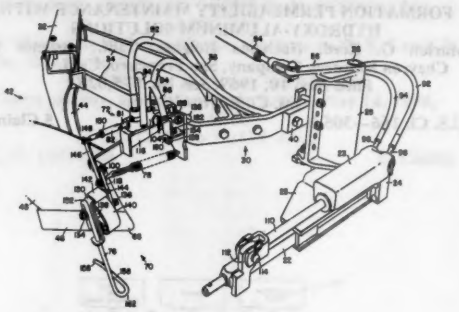
Loren Glenn Arnold, Rock Island, and Richard Dale Nelson, Cambridge, both of, Ill., assignors to Deere & Company, Moline, Ill.

Continuation-in-part of application Ser. No. 733,115, May 29, 1968, now abandoned. This application Jan. 7, 1970, Ser. No. 1,217

Int. Cl. A01b *69/00, 65/02*

U.S. Cl. 172—26 **13 Claims**

An automatic landing device for semi-integral moldboard plows of the type having adjustable hitches with at least a portion of the hitch being interconnected with the frame of the plow by an extensible and retractable hydraulic cylinder for landing. Mounted on the plow frame is a furrow finder having a furrow wall contacting member. The furrow wall contacting member is interconnected with a three-position valve by means of a push rod, the valve controlling flow of fluid from a tractor hydraulic system to the cylinder. The plow frame is shifted relative to the tractor in response to movement of the member so that a fixed distance is maintained between the foremost plow bottom on the plow frame and the adjacent furrow wall.



3,603,406

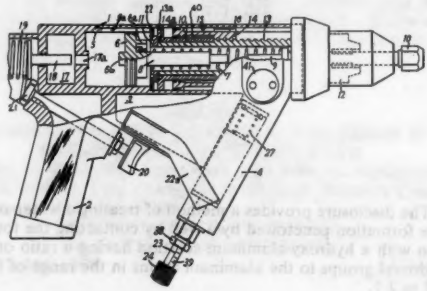
EXPLOSIVE OPERATED POWER TOOL WITH IMPACT AND ROTATION

Peter Bruno Kahn, Ilford, England, assignor to G. K. N. Screws & Fasteners Limited, Warley, England and The Plessey Company Limited, Ilford, England

Filed Sept. 25, 1969, Ser. No. 860,892

Int. Cl. B25d *9/10*

U.S. Cl. 173—108 **6 Claims**



The specification discloses a power tool, particularly for inserting self-tapping screws, comprising a working element which is arranged to be impacted and rotated and means in the body to receive a metered charge of an explosive liquid fuel which when exploded produces high pressure gas which causes the operation of the working element. The liquid fuel is preferably a monofuel.

3,603,407

WELL DRILLING APPARATUS

Wallace Clark, 1830 S. German Church Road, Indianapolis, Ind.

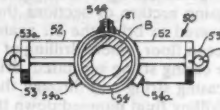
Continuation-in-part of application Ser. No. 705,436, Feb. 14, 1968, now abandoned. This application Dec. 29, 1969, Ser. No. 888,711

Int. Cl. E21b *7/12*

U.S. Cl. 175—6 **18 Claims**

Drilling apparatus in which the motive force for the drill bit comprises a fluid motor disposed relatively close to the drill bit, the fluid motor comprising a pair of helicaL gears fitted one within the other, the outer gear having internal helical threads and comprising the rotor to which the drill bit is connected, the inner gear having external threads and being fixed against rotation, the arrangement being such that

the inner gear is free to gyrate when driving force flows between the gears so that the outer gear member and the attached drill bit will rotate in a concentric path. Apparatus in accordance with the invention may be used in land drilling



operations or adapted for use in underwater drilling operations, such adaptations including the use of a drill support and a flexible connection to a platform or workboat situated above the drilling site.

3,603,408

SUBMARINE DRILLING APPARATUS

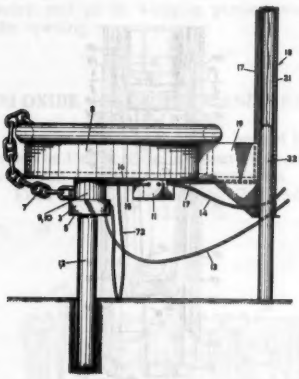
August Hendrik Maria Smulders, 13 Van Bronckhorstlaan, Wassenaar, Netherlands

Filed Oct. 6, 1969, Ser. No. 864,104

Claims priority, application Netherlands, Oct. 17, 1968, 68-14 339

Int. Cl. E21b *7/12*; E21c *19/00*

U.S. Cl. 175—6 **11 Claims**



Submarine drilling apparatus comprises a rotor and a stator with a drill casing detachably connected to the stator and a drill which is in the casing and suspended from the rotor. The apparatus is lowered from a vessel to the bottom, where it rests on at least three supports, at least one of which is the drill. The drill is hydraulically operated from a source on the vessel, and the remaining supports are also hydraulically operated, with a distributor valve that is automatically operated by a universally suspended pendulum so as to regulate the hydraulic system to maintain the drill upright. After drilling, the casing is cemented, for example by filling it with cement to provide submarine securement for an anchor chain. The onset of cementing automatically disengages the stator from the casing so that the apparatus can be raised leaving the casing in place. Continued raising of the apparatus disconnects and raises the cementing conduit.

3,603,409

METHOD AND APPARATUS FOR BALANCING SUBSEA INTERNAL AND EXTERNAL WELL PRESSURES

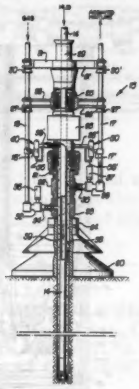
Bruce J. Watkins, Palos Verdes Estates, Calif., assignor to Regan Forge and Engineering Company, San Pedro, Calif.

Filed Mar. 27, 1969, Ser. No. 811,052

Int. Cl. E21b *15/02*, *41/00*

U.S. Cl. 175—7 **6 Claims**

Method and apparatus for maintaining a pressure balance between internal and external subsea well pressures during underwater drilling, entry and reentry operations conducted from a floating vessel remote from the subsea well comprising injecting gas into the wellhead apparatus in amounts sufficient to cause the density of the well fluid or mud returns below the surface of the sea to approximate the density of



sea water and controlling the injection of such gas and thus the internal well fluid pressures by sea water well pressure differential and control means associated with valve means located in gas injection and return lines at the subsea well apparatus.

3,603,410

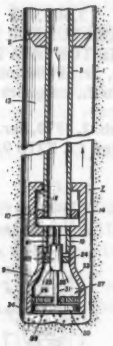
METHOD AND APPARATUS FOR CAVITATIONAL DRILLING UTILIZING PERIODICALLY REDUCED HYDROSTATIC PRESSURE

Frank A. Angona, Dallas, Tex., assignor to Mobil Oil Corporation

Filed Dec. 5, 1968, Ser. No. 781,424

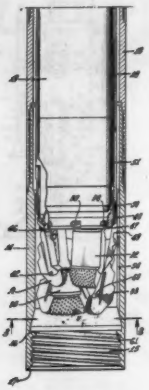
Int. Cl. E21b *7/00*

U.S. Cl. 175—65 **9 Claims**



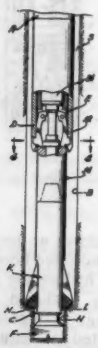
This specification discloses an improved method and apparatus for drilling a liquid-filled borehole into the earth with cavitational energy. The hydrostatic pressure at the borehole bottom is periodically reduced. Simultaneously, high frequency acoustic energy is imposed in the drilling liquid and cavitation is effected at least during the period of reduced hydrostatic pressure. The shock waves resulting from cavitation in the drilling liquid are utilized for drilling the borehole.

3,603,411
RETRACTABLE DRILL BITS
Howard D. Link, Salt Lake City, Utah, assignor to Christensen Diamond Products Company, Salt Lake City, Utah
Filed Jan. 19, 1970, Ser. No. 3,971
Int. Cl. E21b 9/26
U.S. Cl. 175—259 27 Claims



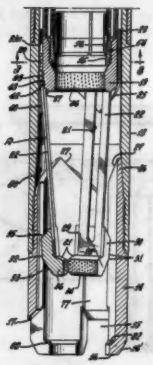
A carrier supports an upper set of downwardly tapering or wedge-shaped drill bit cutters which overlap and alternate circumferentially with a lower set of upwardly tapering or wedge-shaped cutters, the sets of cutters being in retracted position for movement by the carrier through a tubular drill string and into a drive mandrel at the lower end of the latter. Downward movement of the upper set of cutters along and between the lower set expands and couples both sets of cutters to the drive mandrel and increases their effective drilling diameter to a value greater than the outside diameter of the mandrel, the combined cutting surfaces of both sets of cutters being circumferentially continuous. The carrier moves down behind the cutters to lock them in their expanded condition. Elevation of the carrier pulls the upper cutters upwardly along the lower cutters and effects retraction of both sets of cutters inwardly of the mandrel, permitting their upward removal through the drill string to the drilling rig.

3,603,412
METHOD AND APPARATUS FOR DRILLING IN CASING FROM THE TOP OF A BOREHOLE
Archer W. Kammerer, Jr., Fullerton, and Gary R. Johnson, Anaheim, both of, Calif., assignors to Baker Oil Tools, Inc., Commerce, Calif.
Filed Feb. 2, 1970, Ser. No. 7,628
Int. Cl. F21b 9/26
U.S. Cl. 175—260 8 Claims



Apparatus and method for drilling in casing at the top of a borehole, such as drilling a borehole commencing at an ocean floor, including inserting a retrievable coupling device in a casing shoe aboveground and expanding the coupling members of the device into shoe slots to secure the coupling device to the shoe, a bit being secured to the coupling device with expandable cutters to drill a borehole larger than the outside diameter of the casing or casing pile. The shoe is then secured to a casing section or sections thereabove and the casing string lowered to bring the bit against the top of the formation, or ocean floor, where drilling of the borehole is to commence. The casing string is rotated, drilling weight being applied to the casing string and through the coupling device to the bit, and drilling fluid pumped down the casing string to remove the cuttings from the bottom of the borehole being produced. When the borehole has been drilled to the required depth, the coupling members are retracted from the shoe slots, and the assemblage of coupling device and bit, with its cutters retracted, elevated through the casing string and withdrawn therefrom at the top of the finished borehole. The casing string or piling remains in the borehole and can be cemented in place therein.

3,603,413
RETRACTABLE DRILL BITS
Werner K. Grill, and Howard D. Link, both of Salt Lake City, Utah, assignors to Christensen Diamond Products Company, Salt Lake City, Utah
Filed Oct. 3, 1969, Ser. No. 863,659
Int. Cl. F21b 9/26
U.S. Cl. 175—261 27 Claims

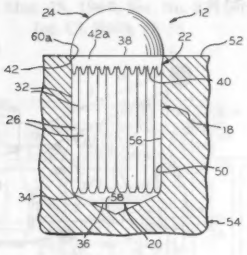


Rotary drill bit cutters lowered on a carrier through a tubular drill string to a drive mandrel or body at the lower end of the string. A device orients or aligns the cutters with slots in the mandrel into which the cutters are expanded and then locked in expanded condition by the carrier, enabling drilling torque and weight to be transmitted from the rotating drill string and mandrel to the cutters, causing the latter to produce a cutting action in the formation. Elevation of the carrier retracts the cutters inwardly of the mandrel for withdrawal through the drill string to the drilling rig. The carrier may support a core tube for receiving a core produced by the cutters.

3,603,414
INSERT FOR DRILLING UNIT
Frank E. Stebley, 3815 Nemesis Ave., Gurnee, Ill.
Filed Jan. 30, 1970, Ser. No. 7,135
Int. Cl. E21c 13/01, 13/06
U.S. Cl. 175—374 17 Claims

A solid wear-resistant sintered metallic carbide insert adapted for forcible insertion into an opening in a working face of a drill member includes a generally polygonal body portion having at least about 12 sides extending between a base end and an opposite head end thereof, and a generally conical wedging portion on the head end of the body portion diverging outwardly therefrom and having an outer diameter greater than the diameter of the body portion, the wedging portion intersecting the body portion whereby the corners

formed by the body portion sides terminate intermediate the outer and inner ends of the wedging portion to provide a smooth annular wedging surface on the outer end of the wedging portion, the body and wedging portions being insertable into the working face opening for mounting them therein with the body portion engaging the wall of the opening in an interference fit and the outer end of the wedging portion wedged in the opening adjacent the working face. A



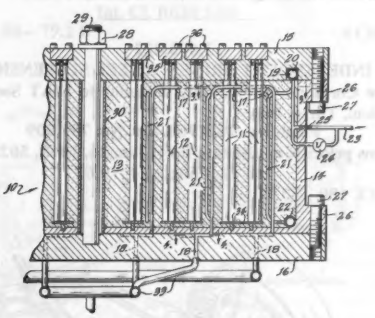
unit for drilling earth formations includes a drill member having a working face provided with a generally circular insert opening extending inwardly therefrom, the opening terminating at the working face in an outwardly divergent conical mouth, and the insert mounted in the opening with its body portion engaging the wall of the opening in an interference fit and the outer end of its wedging portion wedged in the mouth of the opening.

3,603,415

THULIUM OXIDE HEAT SOURCE AND METHOD FOR FORMING SAME

Charles H. Allen, and Charles E. Leach, both of Pasco, Wash., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 9, 1968, Ser. No. 751,454
Int. Cl. G21g *1/02*
U.S. Cl. 176—10 **9 Claims**



An internally shielded radioisotopic heat block with the preferred fuel, thulium oxide rods, separated from the coolant by a metal heat-exchange medium. The fuel elements may be removed from the heat block with only moderate shielding and reirradiated while still clad.

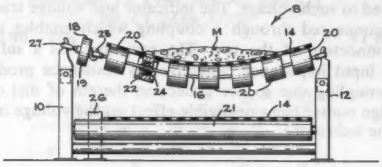
3,603,416

WEIGHING APPARATUS FOR BELT CONVEYOR

William V. Spurlin, Indiana, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed May 18, 1970, Ser. No. 38,083
Int. Cl. G01g *11/14*
U.S. Cl. 177—1 **14 Claims**

A weighing apparatus for a conveyor belt includes at least one belt supporting roller mounted on a flexible but nonextensible supporting cable or linkage which has at least one end thereof operatively connected to a load cell to measure the tension or tensile force in the supporting cable or linkage.



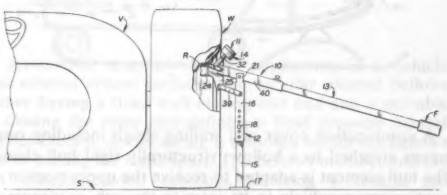
Belt speed is transmitted to the load cell by a tachometer generator so that the output from the load cell is proportional to the flow rate and can be fed into a totalizer and rate indicator for visual recordation.

3,603,417

WEIGHING APPARATUS FOR WHEELED VEHICLES

Hilton J. Wachholz, 2460 Medina Ave., Columbus, Ohio

Filed Dec. 16, 1969, Ser. No. 885,457
Int. Cl. G01g *21/00*
U.S. Cl. 177—126 **9 Claims**



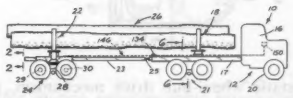
A weighing apparatus is provided for determining the weight of an object by lifting and supporting the object on a fluid-pressure-responsive sensing unit having a direct-reading visual weight indicator. The apparatus structure includes the sensing unit carried by a parallelogram linkage mounted on a support strut and a force-multiplying actuating lever connected to the linkage. Forming the sensing unit is a fluid-filled cylinder having a piston slideably mounted therein and a fluid pressure gage in communication with the cylinder. A contact shoe pivotally mounted on the sensing unit overlies the piston and prevents application of lateral forces to the piston which could result in binding as a consequence of the slight lateral displacement of the sensing unit during a lifting operation.

3,603,418

VEHICLE LOAD MEASURING APPARATUS

Kenneth J. Schmidt, and James A. Lacock, both of Springfield, Oreg., assignors to General Trailer Co., Inc., Springfield, Oreg.

Filed Oct. 17, 1969, Ser. No. 867,265
Int. Cl. G01g *19/08*
U.S. Cl. 177—136 **8 Claims**



Apparatus for use in a vehicle for measuring a load supported thereon including a deformable member which deforms in relation to the weight of the load, a DC voltage

transmitter connected to the member for transmitting a voltage related to the deformation of the member, with a given DC voltage supplied to the transmitter, and an indicator connected to the voltage transmitter for producing an indication related to such voltage. The indicator and voltage transmitter are connected through a coupling which enables selective disconnection of the two. The indicator has a sufficiently high input impedance, whereby any resistance produced in the coupling due to the collection therein of dirt or other foreign matter has a negligible effect on the voltage indicated by the indicator.

3,603,419

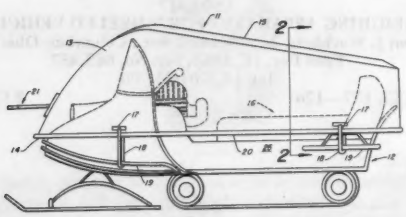
COMBINATION COVER AND TRAILING SLEIGH FOR TRACTION SNOW VEHICLES

Kenyon L. Riddle, 3789 Hillside Lane, Salt Lake City, Utah

Filed July 15, 1969, Ser. No. 841,911

Int. Cl. B62m *27/02*

U.S. Cl. 180—5 R **6 Claims**



A combination cover and trailing sleigh including runner means attached to a hollow, structurally rigid hull element. The hull element is adapted to receive the upper portion of a traction snow vehicle in its interior through an opening so that it may be placed atop the vehicle as a cover. One or more runners are attached to the outside surface of the hull element opposite the opening so that the hull element may be towed by the vehicle as a sleigh.

3,603,420

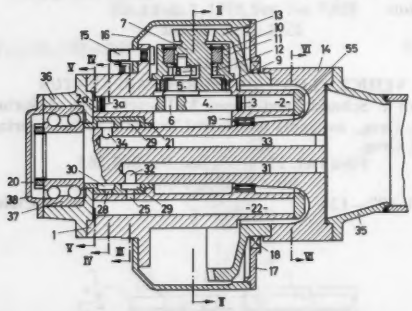
HYDROSTATIC WHEEL-HUB DRIVE MECHANISM PRIMARILY FOR VEHICLES NOT TIED TO RAILS

Heinrich Peter Brandt, Wiehl, Germany, assignor to Fritz Kotz and Christian Peter Kotz

Filed June 20, 1969, Ser. No. 834,983

Int. Cl. B60k *7/00*

U.S. Cl. 180—66 F **5 Claims**



A hydrostatic wheel-hub drive mechanism, primarily for vehicles not tied to rails, characterized by the provision within the wheel hub of hydrostatically driven pairs of pistons, each pair having a common piston rod arranged parallel with the axis of the wheel hub and gearing operable to convert the reciprocating motion of the pairs of pistons to rotary motion of the wheel.

3,603,421

INDEPENDENT SUSPENSION DEVICE FOR SUSPENDING AUTOMOBILE WHEELS

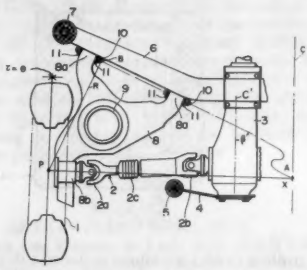
Teruo Maeda, and Susumu Miyata, both of Yokohama, Japan, assignors to Nissan Jidosha Kabushiki Kaisha, Yokohama, Japan

Filed Nov. 29, 1968, Ser. No. 779,929

Claims priority, application Japan, Dec. 4, 1967, 42/77,565

Int. Cl. B60g *3/14*

U.S. Cl. 180—73 R **1 Claim**



An independent suspension device for suspending each wheel of an automobile, having a suspension arm means for axially supporting each wheel. The suspension arm means is pivotally carried by a suspension member in such manner that the axis of rotation of the suspension arm means is horizontally slanted relative to the longitudinal axis of the automobile by a first angle, and the axis of rotation of the suspension arm is also vertically inclined with respect to a horizontal plane by a second angle. The first angle is so related with the second angle that the camber thrust force generated in the automobile body by the motion of the wheel relative to the automobile body is always cancelled by the cornering force generated by said motion of said wheel, regardless of the magnitude of the bouncing motion of the wheel. Whereby, the straight maneuverability and the ride of the automobile are greatly improved.

3,603,422

INDEPENDENT DRIVEN WHEEL SUSPENSION

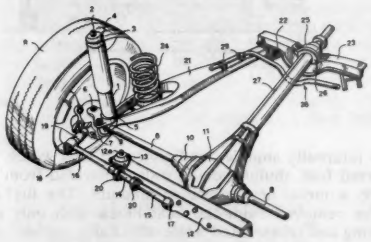
Ettore Cordiano, Turin, Italy, assignor to FIAT Societa per Azioni, Turin, Italy

Filed Dec. 26, 1968, Ser. No. 787,009

Claims priority, application Italy, Jan. 26, 1968, 50290-A/68

Int. Cl. B60g *3/14, 19/02*

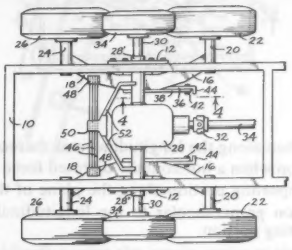
U.S. Cl. 180—73 TL **6 Claims**



An independent suspension for a driven wheel of a vehicle includes a trailing arm pivoted at one end to the wheel hub support and at the other end to the suspended body to transmit longitudinal (driving) stresses. The wheel is driven by a stub shaft which is connected to a differential via universal joints and which is effective to transmit transverse loads between the wheel hub support and the suspended body through the casing of the differential. A transverse link is

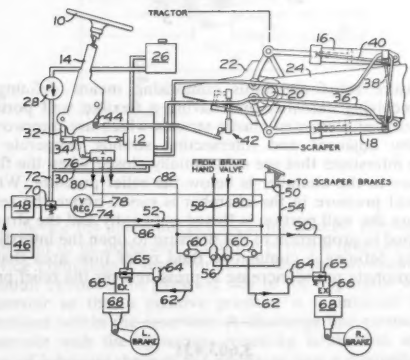
pivoted between the wheel hub carrier and the body to prevent wobbling of the wheel.

3,603,423
TRACTION CONTROL SYSTEM FOR TANDEM TYPE VEHICLE WHEELS
Richard H. A. Schoonover, West Linn, Oreg., assignor to Katrak Vehicle Co., Canby, Oreg.
Filed Mar. 28, 1969, Ser. No. 811,512
Int. Cl. B60k *17/36*
U.S. Cl. 180—74 **4 Claims**



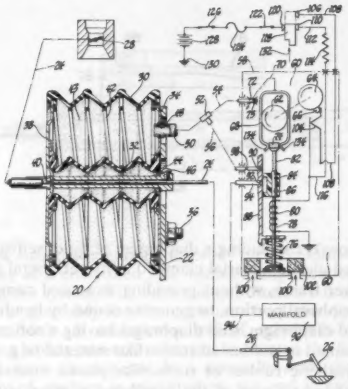
The tandem wheels of a vehicle are interconnected through their axles or drive differential mechanism in such manner that the driving or braking force tending to elevate one of the wheels off the road is opposed by a force derived from the resultant driving or braking torque of the axles or differential mechanism.

3,603,424
AUXILIARY EMERGENCY STEERING FOR ARTICULATED VEHICLES
Ernest R. Blood, and Edward J. Ohms, both of Washington, Ill., assignors to Caterpiller Tractor Co., Peoria, Ill.
Filed Feb. 25, 1969, Ser. No. 802,058
Int. Cl. B62d *5/06*
U.S. Cl. 180—79.2 B **4 Claims**



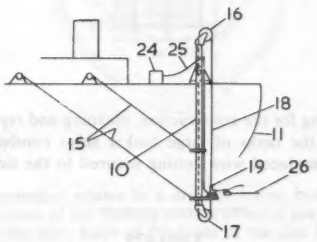
Emergency steering for a vehicle which is normally steered by a hydraulic fluid system and has fluid actuated brakes. When pressure in the steering system falls below a safe valve air from the brake system is directed through a valve controlled by the steering system selectively to the right brake or left brake depending upon the direction in which the steering wheel is turned thus causing what is known as steering by braking.

3,603,425
VEHICLE CRUISE CONTROL SERVOMOTOR
David D. Campbell, Lake Orion, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 12, 1969, Ser. No. 849,321
Int. Cl. B60k *31/00*
U.S. Cl. 180—108 **3 Claims**



A servomotor assembly having application in a vehicle cruise control system including an annular pleated bellows member having a fixed wall closing one end and a movable wall closing the other end defining a fluid pressure control chamber therein. A coil spring is disposed within the bellows member biasing the walls apart. The bellows member and the walls contain central openings receiving a control rod therethrough upon which is mounted a slidably adjustable stop member. The stop member is positioned for engagement by the movable wall during contraction of the bellows thereby actuating the control rod in accordance with the prevailing pressure fluid within the bellows member.

3,603,426
APPARATUS FOR MARINE SEISMOGRAPHIC PROSPECTING
William Neilson, Stevenston, Scotland, assignor to Imperial Chemical Industries Limited, London, England
Continuation of application Ser. No. 775,028, Nov. 12, 1968, now abandoned. This application Feb. 24, 1970, Ser. No. 14,747
Int. Cl. G01v *1/04, 1/38*
U.S. Cl. 181—0.5 VM **13 Claims**



Apparatus for marine seismographic prospecting consists of a boom and a movable charge carrier attached to the boom.

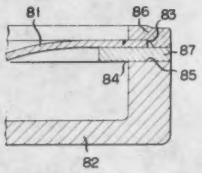
Using this apparatus an explosive charge may be submerged and towed at a constant, predetermined depth behind the ship.

3,603,427

LOUDSPEAKER

Hiromi Sotome, Hamamatsu-shi, Shizuoka-ken, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed May 5, 1969, Ser. No. 821,803
Int. Cl. G10k *13/00*; H04r *7/00*
U.S. Cl. 181—32 7 Claims



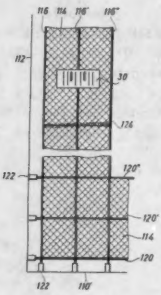
A loudspeaker including a diaphragm of rigid, self-supporting, foamed plastic material clamped at its peripheral portion to a speaker frame, without providing increased compliance at said peripheral portion, to generate sound by bending motion of said diaphragm, said diaphragm having a soft material such as foamed or unfoamed rubberlike material (e.g. natural rubber, synthetic rubber or rubberlike plastic material) applied on at least a part of the peripheral portion at at least one side thereof, said soft material having relatively high specific gravity sufficient to suppress divided vibration of the diaphragm in low frequency sound range.

3,603,428

SCAFFOLDING FOR THE TANKS OF LARGE TANKER SHIPS

Otto Hanses, Hamburg-Billstedt, Hamburg 74, Germany

Filed Sept. 15, 1969, Ser. No. 857,663
Claims priority, application Germany, Feb. 8, 1969, Sept. 19, 1968, P 19 06 341.3;P 17 81 270.3-22
Int. Cl. E04g *3/00*
U.S. Cl. 182—82 17 Claims



Scaffolding for the construction, cleaning and repair of the interior of the tanks of large tanker ships consists of permanently emplaced wire netting secured to the sides of the tank.

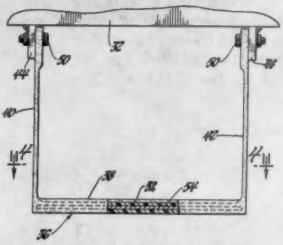
3,603,429

STEP ATTACHMENT FOR TRACTOR

Larry L. Shepherd, Wickliffe, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed July 15, 1970, Ser. No. 55,061
Int. Cl. E06l *5/26*
U.S. Cl. 182—191 2 Claims

A U-shaped step member for attachment to the frame of a tractor. The step member is molded entirely from an elastomeric material and has a foot supporting portion reinforced by a metal insert. The legs of the step member are formed as straps and, when attached to the tractor, are designed to deflect when a force is applied to the foot supporting portion along the longitudinal axis thereof but will resist deflection when a horizontally directed force is applied to the foot supporting portion along the plane of the latter and in a direction perpendicular to the longitudinal axis of the foot supporting portion.

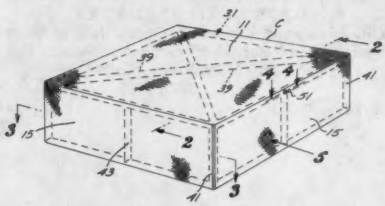


3,603,430

PRESSURE RELIEF IMPACT ABSORBING APPARATUS

Robert T. Kendall, 752 Via Somonte, Palos Verdes Estates, Calif., and Robert S. Tanibata, 16515 Brighton Ave., Gardena, Calif.

Continuation of application Ser. No. 636,706, May 8, 1967, now abandoned. This application Mar. 11, 1970, Ser. No. 18,002
Int. Cl. F16k *17/36*; A62b *1/22*
U.S. Cl. 182—137 10 Claims



Pressure relief apparatus comprising means defining a fluid-receiving chamber and having a flexible wall portion consisting of elongated elastic strands which are interwoven whereby adjacent and intersecting strands cooperate to define interstices that are substantially closed when the fluid pressure in the chamber is below the relief pressure. When the fluid pressure in the chamber is raised above the relief pressure the wall portion is flexed outwardly and the strands stretched in proportion to the pressure to open the interstices thereby defining a cumulative fluid relief flow area that is proportionate to the increase in pressure over the relief pressure.

3,603,431

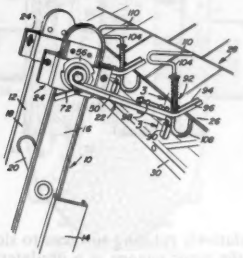
LADDER AND SUPPORT BRACKET THEREFOR

Alfred E. Nameche, 666 W. Spring, Lima, Ohio, and Walter F. Norton, 2343 Shawnee Blvd., Lima, Ohio

Continuation-in-part of application Ser. No. 736,042, June 11, 1968, now Patent No. 3,486,580. This application Dec. 15, 1969, Ser. No. 884,792
Int. Cl. E06c *1/36*
U.S. Cl. 182—206 11 Claims

A support arm for a ladder including mounting structure on one end of the arm rotatable relative to the latter about an axis extending transversely of the arm. The mounting structure is adapted for securement to the upper end of a

ladder and the mounting structure and arm include structure for releasably locking the arm against rotation relative to the mounting structure in one direction past a predetermined position of rotation of the arm. In addition, spring means is operatively connected between the arm and the mounting



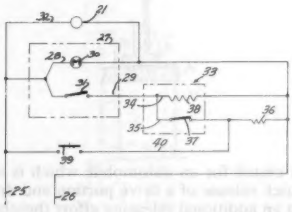
structure yieldingly urging the arm to swing in the aforementioned one direction relative to the mounting structure and the free end of the arm includes clamp structure for clamping engagement with a portion of a building structure against which the upper end of the associated ladder is leaned.

3,603,432

APPARATUS FOR PERIODICALLY DISPENSING A LIQUID

Wallace I. Stenzel, Thiensville, Wis., assignor to Waukee Engineering Co., Milwaukee, Wis.

Filed Dec. 11, 1968, Ser. No. 783,081
Int. Cl. F16n *29/02*
U.S. Cl. 184—6 D **4 Claims**



A device for automatically metering precise amounts of a lubricant to an apparatus requiring periodic lubrication. The device comprises a reservoir to contain the lubricant and a conduit connects the pressure side of the apparatus with the reservoir so that a positive pressure is maintained on the lubricant within the reservoir. A discharge line connects the reservoir with the apparatus requiring lubrication and the flow of lubricant through the discharge line is controlled by a solenoid-operated valve. In addition to the solenoid valve, an adjustable needle valve is located between the solenoid-operated valve and the apparatus and functions to adjust the rate of flow of the lubricant when the solenoid valve is opened. The flow through the discharge line can be viewed through a sight glass located downstream of the needle valve.

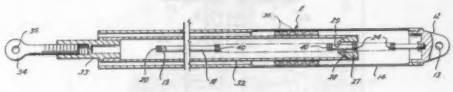
Operation of the system is automatically controlled by a dual-timer arrangement including a cycle timer which sets the periodic cycle of lubrication and opens the solenoid valve through a time-delay relay. The time-delay relay sets the time of lubrication for each cycle.

3,603,433

LOW ONSET RATE ENERGY ABSORBER

William H. Keathley, Pasadena, and Clarence J. Wesselski, Alvin, both of, Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Mar. 31, 1970, Ser. No. 24,154
Int. Cl. F16f *7/12*
U.S. Cl. 188—1 C **10 Claims**



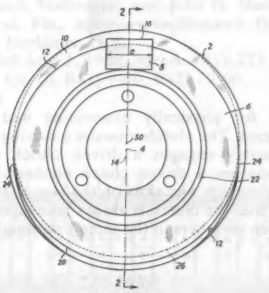
A low onset rate energy absorber for decelerating a moving mass at a controlled rate without amplification of loads through the system. The embodiment disclosed is in the form of a strut assembly for the crew couch of the Apollo command module. It includes a rod of substantially uniform diameter having one end arranged to receive the force of the moving mass thereagainst in a generally axial direction. A plurality of washers is mounted on the rod in spaced-apart and force-fitting relationship. It includes thrust means arranged to receive the force in the generally axial direction and for initially contacting and axially stroking an end one of the washers and sequentially stroking others of the washers along the rod in response to a force applied in the axial direction. The energy absorber uses friction as a direct means of converting the energy to heat.

3,603,434

DISC FOR A DISC BRAKE

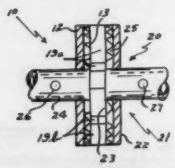
Roger Leroux, Paris, France, assignor to Societe Anonyme D.B.A.

Filed June 2, 1969, Ser. No. 829,812
Int. Cl. F16d *65/12*
U.S. Cl. 188—73.6 **3 Claims**



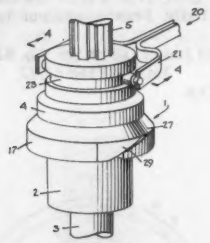
This invention relates to a disc for a disc brake in which the extraction of the braking pads is effected parallelly to the plane of the disc. Each of the faces of the disc comprises at the periphery thereof a cutout portion provided through all the thickness of the disc or through at least a portion of said thickness, the length of the chord joining the intersection points of said cutout portion with the external edge of the groove made by the pad on the corresponding face being at least equal to the maximum size of said pad measured in a direction perpendicular to the direction of extraction of said pad. The pads are extracted easily after turning the disc to bring the pads to protrude out of the cut portion.

3,603,435
AIR COOLED DISC BRAKE ROTOR
Wallace C. Buzzard, 5901 Lancer Court, Dayton, Ohio, and Joseph E. Krysiak, 510 Wilmington Ave, Dayton, Ohio
Filed Oct. 16, 1969, Ser. No. 866,930
Int. Cl. F16d *65/12*
U.S. Cl. 188—218 XL **1 Claim**



An aircraft wheel disc brake rotor having a pair of disc members joined together by curved support rib elements mounted in raised relation on, and arranged to channel cooling air over the internal surfaces of the disc members. This cooling air, which is centrifugally directed by rotational movement of the disc members, is supplied through openings provided in either the rotor itself or in the rotor axle. The internal surface of each disc member is further fabricated with a series of grooves formed into a curvilinear ridge pattern that both provides a greater cooling surface area and ensures more efficient control and direction of the cooling air.

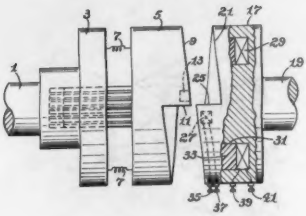
3,603,436
ONE-POSITION CLUTCH
Robert J. Bartholomew, Logan, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Sept. 24, 1969, Ser. No. 860,656
Int. Cl. F16d *11/04*
U.S. Cl. 192—46 **5 Claims**



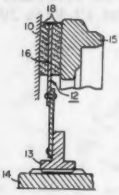
A clutch for physically connecting and disconnecting driven elements. The clutch includes a driving clutch element which releasably engages a driven clutch element which releasably engages a driven clutch element by means of a pair of coupling lugs and slots on the two elements which are so arranged that the clutch is always reengaged with the driving and driven members in the same rotational position.

3,603,437
POSITIVE POSITION BRAKE-CLUTCH
Glenn S. Spencer, Big Flats, N.Y., assignor to The Bendix Corporation
Filed June 8, 1970, Ser. No. 44,300
Int. Cl. F16d *27/04, 43/26, 65/16*
U.S. Cl. 192—53 D **17 Claims**

A pair of members have opposed spiral surfaces formed about an axis and surfaces connecting the ends of each spiral surface to form stops. The spiral surfaces are energy-absorbing surfaces and are urged apart by spring means. The members are relatively rotatable about the axis and relatively movable along the axis. One of said members has disposed therein an annular magnet having a flux path through the members and across a space therebetween. Synchronizing means activates the magnet when there is a specified angular relationship between the surfaces so that the magnet provides flux that draws the surfaces into contact over a small area which increases with relative rotation, thereby increasing the magnetic force between the surfaces and the energy absorbed by the relatively rotating surfaces to slow the relative rotation before the stops engage at a predetermined angular relationship.



3,603,438
FRICTION CLUTCH FOR AN AUTOMOBILE
Toichi Hashizume; Isao Nagai; Katsuhiko Umeda; Tadaaki Otokuni, and Yuji Takahashi, all of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama, Japan
Filed May 19, 1969, Ser. No. 825,642
Claims priority, application Japan, June 5, 1968, June 5, 1968, June 5, 1968, 43/47130;43/47129;43/47128
Int. Cl. F16d *13/40, 69/00*
U.S. Cl. 192—107 C **4 Claims**

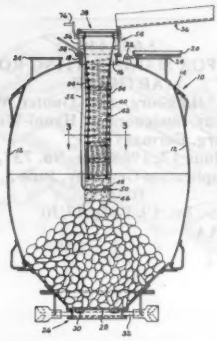


A friction clutch for an automobile which is so formed as to permit quick release of a drive portion and driven portion by providing an additional releasing effort therebetween. The friction clutch comprises a drive portion consisting of a flywheel secured to the engine shaft, and a pressure plate, and a driven portion consisting of a friction disk disposed between the flywheel and the pressure plate and a splined hub to which the friction disk is secured and meshed in spline with the input shaft of a transmission wherein the friction disk is formed in such a manner that it has a predetermined angle with a bend formed at its plate with respect to the flywheel.

3,603,439
LOADING APPARATUS FOR RAILWAY HOPPER CARS
Ervin I. Pietsch, St. Charles, and John L. Carney, Jr., St. Louis County, both of, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.
Filed Feb. 20, 1970, Ser. No. 13,250
Int. Cl. B65g *11/10*
U.S. Cl. 193—25 R **5 Claims**

A loading apparatus particularly for loading a railway hopper car with a perishable bulk commodity, such as potatoes or oranges. The loading apparatus includes a flexible fabric chute reinforced circumferentially by a spiral spring wire and having a lower valve portion to control the

discharge of the lading from the lower end of the chute. Rings or hoops are spaced along the height of the chute and



have eyes thereon to guide ropes or the like for retracting or extending the chute as the hopper is filled with the lading.

3,603,440

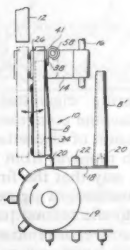
IMPROVED BOBBIN CAGE

Lester W. Pray, Clemson, and Carey A. Glazener, Seneca, both of, S.C., assignors to Maremont Corporation, Chicago, Ill.

Continuation-in-part of application Ser. No. 798,389, Feb. 11, 1969, now Patent No. 3,531,016. This application Oct. 13, 1969, Ser. No. 865,943

Int. Cl. F16d *11/06*

U.S. Cl. 193—43 **19 Claims**



A bobbin tube cage for receiving bobbin tubes dropped therein, for moving tubes so received laterally in an upright position, and for depositing such tubes so moved onto conveyor pegs in an upright position is disclosed and, preferably, comprises an elongate rectangular structure having a substantially open fourth side, a bottom partially open between one or more inwardly directed flanges extending along the bottom from one or more of the facing closed sides, and in particular a guide means having a normally biased swingable gate means fixed for pivotable movement to and outwardly from one of the closed facing sides and having an inwardly directed arcuate convexity partially overlying the lower portion of the open side. The guide means also includes a guide plate fixed between the closed facing sides adjacent their top and across the open side, which guide plate extends downwardly a distance sufficient to somewhat overlap the top portion of a bobbin tube residing within the cage means.

3,603,441

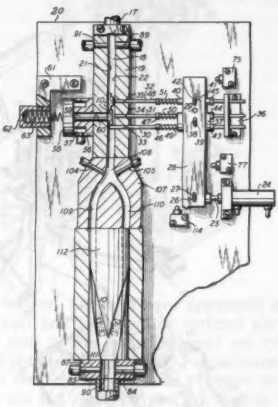
APPARATUS FOR SENSING THE ORIENTATION OF FLAT ARTICLE HAVING A RAISED PORTION ONE SIDE THEREOF

Willie T. Ansell, and James C. McConnell, both of Winston-Salem, N.C., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 27, 1970, Ser. No. 14,914

Int. Cl. B65g *47/24*

U.S. Cl. 193—43 A **4 Claims**



An apparatus senses the orientation of a flat article having a raised portion on one side thereof by forcing the article against a wall where a valve stem is depressed if the raised portion faces the wall. A valve enclosing a chamber is opened by the depression of the valve stem to release fluid pressure from within the chamber. Pressure-sensing facilities operated by the fluid pressure in the chamber control an orientating mechanism to insure that all articles are placed into a predetermined orientation.

3,603,442

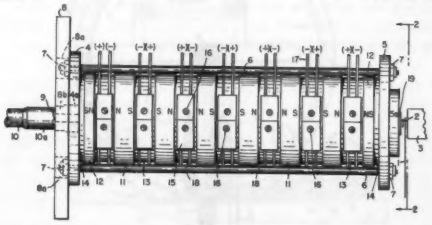
MATRIX PRINTER WITH PARALLEL STYLI AND PLURAL COAXIAL DRIVER COILS

Leonard G. Ward, Melbourne, and John H. MacNeill, Indialantic, both of, Fla., assignors to Mohawk Data Sciences Corporation, Herkimer, N.Y.

Filed Apr. 1, 1969, Ser. No. 812,221

Int. Cl. B41j *9/00*; **B41f** *19/00*

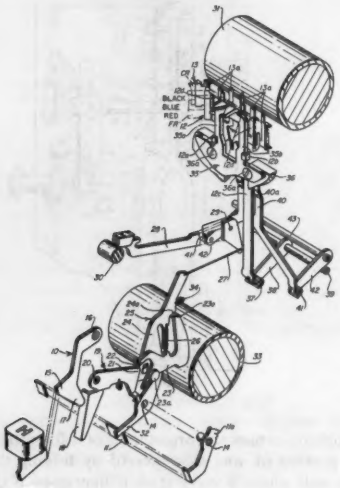
U.S. Cl. 197—1 **22 Claims**



A matrix printer having electrically energizable circular coils spaced along and wound around a cylindrical center pole, styli wires of different lengths which are attached to the coils and extend substantially parallel to the center pole, permanent magnets, and pole members for providing paths for the magnetic lines of force from the magnets across the sides of the coils in directions substantially perpendicular to their axes. By selectively energizing the coils, selected coils are caused to move along the center pole and the styli wires attached to them are moved to print positions. The styli wires

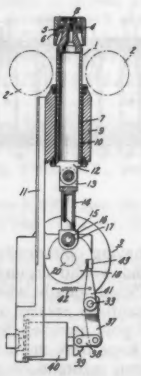
are thereafter withdrawn to nonprint positions by energizing the coils in the opposite directions.

3,603,443
SELECTIVE RIBBON-HANDLING MECHANISM FOR CARBON AND FABRIC RIBBONS
Ronald H. McLean, Newington, Conn., assignor to Litton Business Systems, Inc., New York, N.Y.
Filed Mar. 19, 1969, Ser. No. 808,516
Int. Cl. B41j *35/22, 35/10*
U.S. Cl. 197—156 **2 Claims**



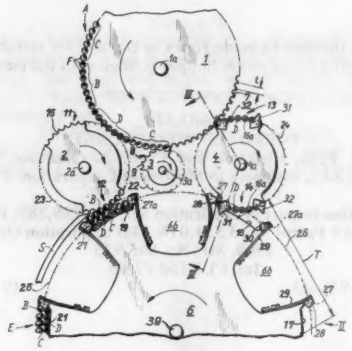
A typewriter ribbon control for switching the operational mode of a typewriter between carbon ribbon, fabric ribbon and stencil operation, having selector means for selectively coupling and uncoupling a power arm to a fabric ribbon elevating mechanism and to a carbon ribbon elevating mechanism, and simultaneously selectively coupling and uncoupling a power drive mechanism to a fabric ribbon feed mechanism and a carbon ribbon feed mechanism.

3,603,444
HIGH-SPEED SORTING DEVICE
James L. Chengges, Trumbull, Conn., and Benjamin F. Hart, Ballston Lake, N.Y., assignors to General Electric Company
Filed Oct. 24, 1969, Ser. No. 869,121
Int. Cl. B65g *47/88*
U.S. Cl. 198—24 **8 Claims**



A hollow diverter pin is sinusoidally reciprocated, to selectively divert articles from a main conveyor, by a crank driven by a trip release one-way clutch and a continuously rotating motor. The clutch will engage and rotate the crank to a new position of the diverter pin, where a solenoid actuated trip disengages the clutch. With the disengagement of the clutch, a positive brake is also set by means of the solenoid to firmly position and hold the diverter pin in its new position.

3,603,445
APPARATUS FOR MANIPULATING ROD-SHAPED ARTICLES
Wolfgang Zausch, Hamburg, and Gunter Wahle, Reinbek, both of, Germany, assignors to Hauni-Werke, Korber & Co. KG, Hamburg, Germany
Filed June 17, 1968, Ser. No. 737,701
Claims priority, application Germany, June 3, 1971, H 63159 III/79b
Int. Cl. B65g *47/30*
U.S. Cl. 198—31 AA **27 Claims**

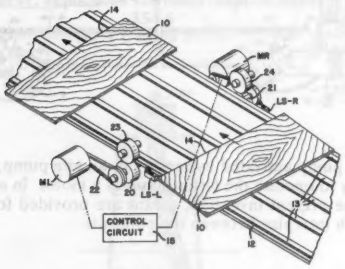


Apparatus for delivering cigarettes from a cigarette machine to a packing machine comprises a supply conveyor which advances a succession of cigarettes past three transfer conveyors each of which removes from the succession a series of groups in such a way that the first transfer conveyor permits predetermined numbers of cigarettes which can form two groups to advance to the second transfer conveyor and that the second transfer conveyor removes a group from each predetermined number and allows a group of cigarettes to reach the third transfer conveyor. All of the transfer conveyors supply groups to the pockets of an assembly conveyor which forms blocks of 20 cigarettes each and delivers such blocks to hollow mandrels in the conveyor of the packing machine. The supply conveyor receives cigarettes from a feed which in turn receives cigarettes directly from a cigarette machine.

3,603,446
SHEET-STRAIGHTENING MECHANISM
Carl W. Maxey, and Kenneth M. Cage, both of Everett, Wash., assignors to The Black Clawson Company, Hamilton, Ohio
Filed Mar. 27, 1969, Ser. No. 810,967
Int. Cl. B65g *15/50, 47/24*
U.S. Cl. 198—33 **4 Claims**

An apparatus for straightening sheets of material carried by a conveyor includes a sheet-sensing switch on each side of the conveyor actuated by the leading edge of the sheet to indicate the magnitude and direction of misalignment. A timing

circuit computes the time difference between the passage of the leading edge of each side of the sheet and controls the



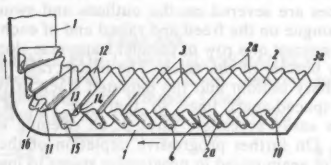
speed of drive motors which thereafter move the sides of the sheet independently of the conveyor to straighten it.

3,603,447

BELT CONVEYOR

Richard Pott, Heide b. Detmold, Germany, assignor to Westland-Gummiwerke GmbH & Co., Westerhausen Kr. Melle, Germany

Filed July 24, 1969, Ser. No. 844,310
Claims priority, application Germany, July 31, 1969, P 17 56 905.0
Int. Cl. B65g *17/12*
U.S. Cl. 198—152 **12 Claims**



A conveyor comprising an endless band which constitutes a moving track and a plurality of adjacent open-topped foldable transporting members secured with their respective bottom portions to the endless band. The transporting members are arranged so that adjoining wall sections of adjacent transporting members are secured to each other and extend at least in the region of these adjoining wall sections at an acute angle relative to the endless band and in direction of movement thereof.

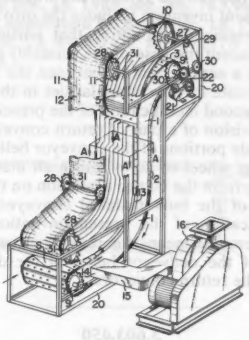
3,603,448

CONVEYER APPARATUS

Tohei Okano, and Takehiko Kannari, both of Osaka, Japan, assignors to The Tsubakimoto Chain Manufacturing Co., Ltd., Jotoku, Osaka, Japan

Filed Nov. 26, 1969, Ser. No. 880,134
Claims priority, application Japan, Jan. 6, 1969, 32/1969
Int. Cl. B65g *15/14*
U.S. Cl. 198—162 **6 Claims**

The present invention relates to a conveyor apparatus which comprises an endless slat conveyor which provides an air suction chamber, a pair of chains surrounding the air suction chamber, a plurality of slats extended between the chains, the slats having air suction ports and, if required, an elastic plate, and a plurality of driving sprockets to drive the endless slat conveyor; an endless backup belt which provides a pair of toothed belts (e.g. chains), the belts being maintained in intimate contact with the edges of the slats, and an airtight wide membrane extended loosely between a pair of the toothed belts (e.g. chains); and an air suction device which has an air suction tube connected to the air suction



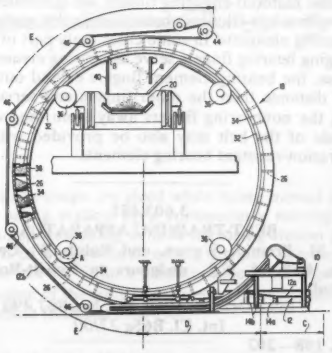
chamber and a blower. This conveyor apparatus is made up of a horizontal part and a vertical or inclined part. Articles supplied on the slats of the horizontal part are covered entirely by the airtight membrane and the membrane is sucked to the surface of the articles when the pressure in the space formed between the slat conveyor and the backup belt drops in the negative. Consequently, the articles are able to be conveyed in the vertical or inclined direction, while holding securely in a sense sandwiched between the slat conveyor and the backup belt.

3,603,449

TRANSITION STRUCTURE BETWEEN CONVEYOR AND ROTARY ELEVATOR WHEEL

Frederick O. Snow, III, Wayne; Francis X. Connelly, Rutherford, N.J.; Harold Glazer, Ocean Springs, Miss., and Nancy K. Latincsics, Wanague, Ala., assignors to Hewitt-Robins Incorporated

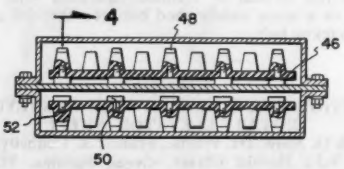
Filed Oct. 6, 1969, Ser. No. 866,792
Int. Cl. B65g *29/00*
U.S. Cl. 198—167 **12 Claims**



The present invention employs a rotatably mounted wheel in combination with a belt conveyor for elevating material conveyed by the conveyor. The wheel has a plurality of storage cells formed around the periphery of the wheel. The conveyor belt wraps around the peripheral section of the wheel trapping the material on the belt in the storage cells and thereby permitting the conveyed material to be elevated to a discharge location. The material is trapped in the compartments by a back plate or seal belt which is maintained in contact with a portion of the inner surface of the wheel. The conveyor belt is maintained in a troughlike condition during

the loading and transporting of the bulk materials conveyed thereby and the side portions thereof are elevated so as to centrally locate the bulk materials thereon prior to contacting the rotatably mounted wheel at which point the conveyor belt is flattened. Stationary and pivotally mounted skirt boards are positioned above and adjacent to the load supporting surface of the conveyor belt so as to guide the bulk materials into the storage cells of the wheel. One modification of the present invention includes the provision of biasing members for resiliently mounting that portion of the conveyor belt subjacent the base of the rotatably mounted wheel so as to assure a sealing contact between the belt and wheel and to compensate for any irregularities in the roundness of the wheel. A second modification of the present invention includes the provision of a pair of return conveyors positioned adjacent the side portions of the conveyor belt along the base of the elevating wheel so as to return all materials inadvertently escaping from the belt to a position on the belt prior to the centering of the bulk material conveyed thereby. One further modification of the present invention includes the provision of removal means for removing material from the outer edges of the conveyor belt and for depositing such material into the return conveyors.

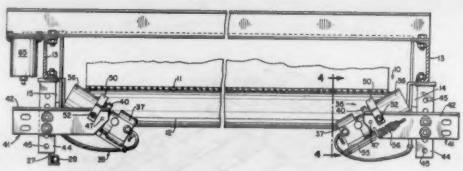
3,603,450
ENCLOSED BELT CONVEYOR
Leon A. Chamberlain; Clarence R. Campbell, and Leif T. Stokes, all of Salt Lake City, Utah, assignors to Envirotech Corporation, Salt Lake City, Utah
Filed Aug. 21, 1969, Ser. No. 851,897
Int. Cl. B65g *15/42*
U.S. Cl. 198—198 **11 Claims**



A belt conveyor is disclosed in which the belt is equipped with upwardly projecting material-engaging fingers and wherein at least that section of the working run which passes between feed and discharge is enclosed by a close-fitting conduit. A belt construction is also disclosed whereby at least part of the material-engaging fingers are constructed from or tipped with a low-friction abrasion-resistant material to provide bearing elements. In some cases, only part of the material-engaging bearing fingers serve as bearing elements. In such instances, the bearing element fingers extend outwardly to a greater distance than the other fingers and serve as spacers holding the nonbearing fingers away from the conduit. The underside of the belt may also be provided with relatively thin abrasion-resistant bearing elements.

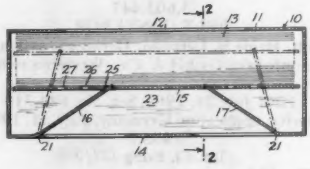
3,603,451
BELT-TRAINING APPARATUS
Robert M. Promin, Wayne, and Ralph W. Coutant, Fair Lawn, both of, N.J., assignors to Hewitt-Robins Incorporated
Filed Oct. 20, 1969, Ser. No. 867,490
Int. Cl. B65g *27/00*
U.S. Cl. 198—202 **11 Claims**

The belt-training apparatus of the present invention includes two sensing units on opposite sides of a belt run, which is to be maintained in properly centered or trained position in relation to a conveyor-supporting frame, and which is supported on idler rollers. At least one of these belt supporting rollers is angularly adjustable to veer the belt run in properly trained position by the action of these sensing units. When the belt run is properly trained, the belt run does not activate the sensing units. Each sensing unit comprises a sensing roller adapted to be engaged by and frictionally driven by the adjacent edge of the belt run, when the belt run strays laterally from properly trained position, and a hydraulic pump coupled to the sensing roller. A hydraulic circuit includes the two pumps of the two sensing units interconnected by pipe connections, through which hydraulic liquid flows



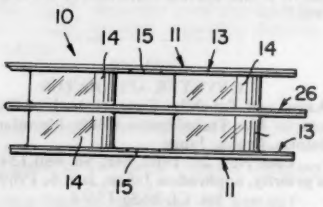
from a pump activated by sensing to an idle pump, and tends thereby to operate the latter pump as a motor. In accordance with the present invention, means are provided for preventing such interplay between the pumps.

3,603,452
TISSUE BOX WITH ADJUSTABLE AUXILIARY BOTTOM
Irving Singer, 2953 Charlotte Drive, Merrick, N.Y.
Filed June 12, 1970, Ser. No. 45,798
Int. Cl. B65d *5/50, 83/00, 85/62*
U.S. Cl. 206—45.16 **2 Claims**



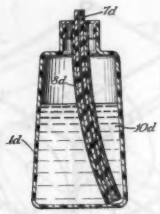
Outlines of two potential braces are punctured on three sides of a rectangle through the main bottom of a paper box. When the stack of tissues in the box is lowered by depletion, the braces are severed on the outlines and swung into the box. A tongue on the freed and raised end of each brace slips into the nearest of a row of parallel transverse slots in a loose auxiliary bottom of the stack. The braces raise and support the auxiliary bottom and the depleted stack at two longitudinally spaced-apart lines so that the top of the stack becomes easily accessible through an opening in the fixed box top. On further progressive depletion of the stack, the braces are again raised in progressive stages to insert the tongues into other slots.

3,603,453
PHARMACAL PACKAGE CONSTRUCTION
John J. Serrell, and George C. Sparks, both of Harleysville, Pa., assignors to Parke, Davis & Company, Detroit, Mich.
Filed June 9, 1969, Ser. No. 831,557
Int. Cl. B65d *75/54, 85/56*
U.S. Cl. 206—47 R **3 Claims**



A pharmacal package wherein a pair of backing sheets are each secured in closing relation with respect to the blisters of a respective blister sheet, and the backing sheets are arranged with the blisters of respective blister sheets in back-to-back adhesively secured relation with respect to each other.

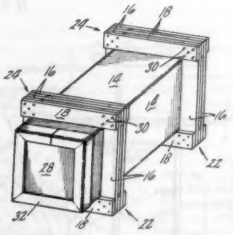
3,603,454
CONTAINER FOR SUBSTANCE INCORPORATING VOLATILES
Helmut W. Raaf, Karlsruhe, Germany, assignor to Pfizer Inc., New York, N.Y.
Filed Sept. 5, 1969, Ser. No. 855,541
Claims priority, application Germany, Sept. 9, 1969, P 17 86 354.6
Int. Cl. B65d *85/70*
U.S. Cl. 206—47 2 Claims



A container for a substance, which must retain a necessary concentration of volatile constituents throughout storage and its useful life, includes a main container permeable to the volatiles and a depot element of a sealing material containing the volatile substance and which provides a sustained slow release thereof. This depot element, particularly intended for thin-walled plastic bottles permeable to volatiles, is shown in the following forms:

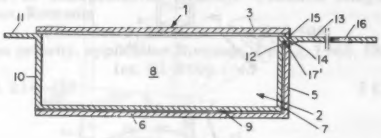
1. Poured fusion of sealing material and volatiles;
2. Granules of the aforementioned;
3. Loose depot element either fused or filled with volatiles;
4. Fixed inside container;
5. Annular depot element surrounding dip tube;
6. Elongated depot element extending above and below surface of liquid;
7. Hollow internal container sealed to wall of container; and
8. Internal partition.

3,603,455
PACKAGE FOR LARGE GLASS PANELS
David A. Bareiss, North Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Aug. 28, 1969, Ser. No. 853,910
Int. Cl. B65d *85/46*
U.S. Cl. 206—62 R 5 Claims



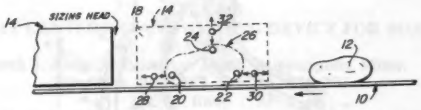
A glass panel shipping and storing container having two similar separate halves, each half formed by spaced L-shaped frame members secured to and held in spaced parallel relation by stiff sheet corrugated cardboard longer than said panels. Each frame member is formed of two legs rigidly joined at one end and formed of spaced boards arranged on edge with respect to said cardboard and intermeshing with an rigidly secured to the boards of the other leg at the joint. The boards of the frame members of one half intermesh with the boards of the corresponding frame members of the other half and are removably secured thereto in the assembled container and form a frame extending entirely around the container. The protruding ends of the cardboard sheets are folded down across the ends of the glass slabs and are secured as by taping to close the package.

3,603,456
DISPLAY HOLDER FOR GOODS
Jean-Marie Bisschop, 98, rue Gerard, Brussels, Belgium
Filed Dec. 16, 1968, Ser. No. 783,967
Claims priority, application Belgium, Dec. 18, 1967, 708,114
Int. Cl. A44b *7/00*; B65d *43/16*
U.S. Cl. 206—78 8 Claims



A holder to be used for the display of goods, comprising a case and a drawer for sliding within the case, the drawer being provided with a tongue for the suspension of the holder. The tongue passes through a slot provided within the case and having a surface for locking the drawer inside the case in the closed position of the drawer.

3,603,457
ELECTRONIC PRODUCT-SIZING APPARATUS
John F. Flodin, 902 Taylor St., and Allan T. Flodin, Rte. 2, Sheller Road, both of, Sunnyside, Wash.
Filed May 28, 1969, Ser. No. 828,607
Int. Cl. B07c *5/342*
U.S. Cl. 209—82 9 Claims

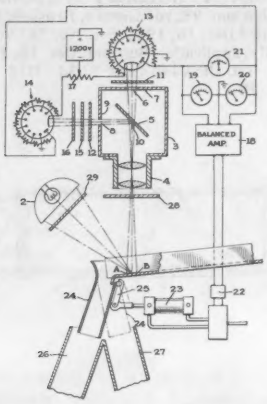


Articles such as crops are sized while being moved past a photoelectric sizing station by a continuously moving conveyor. A set of spaced sizing cells at the sizing station gauge the dimensions of the article to emit a signal if the size and shape of the article is within a predetermined and adjustable range. Generation of the signal operates an ejection device to remove the article from the conveyor.

3,603,458
APPARATUS FOR THE DETECTION AND REMOVAL OF SELECTED FOREIGN MATTER FROM A MATERIAL
George N. Bliss, Franklin, Mich., assignor to Diamond International Corporation, New York, N.Y.
Filed Oct. 7, 1969, Ser. No. 864,490
Int. Cl. G06m *7/00*
U.S. Cl. 209—111.6 16 Claims

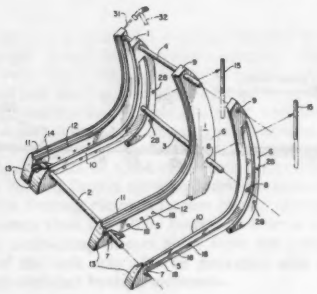
Apparatus to detect and remove yolk-contaminated albumen from uncontaminated albumen as it flows over a darkened area of a chute by means of a camera device focused on said area to receive rays on two focal planes through a

beam splitter where photosensitive devices, one responsive to yellow light and the other blind to yellow light, create an im-



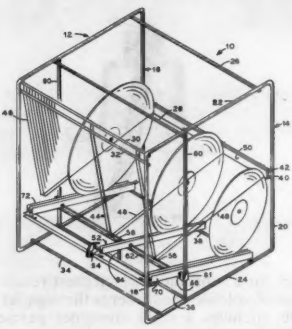
balance when yolk is present, to operate a diverting mechanism downstream of the darkened area.

3,603,459
ADJUSTABLE BICYCLE RACK
Richard I. Erb, 910 Croton Drive, Alexandria, Va.
Filed Apr. 14, 1970, Ser. No. 28,449
Int. Cl. A47f *7/00*
U.S. Cl. 211—20 **17 Claims**



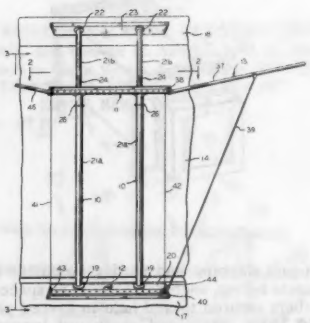
One or more bicycles may be held in the bicycle rack with adjustments made as to differences in tire width, tire diameter, and space between adjacent bicycles. A pair of mirror image L-shaped supporting members is provided for each bicycle, with each supporting member extending vertically and having a plurality of horizontal holes receiving therein parallel supporting tubes. Releasable fasteners are provided to secure supporting members to the tubes in any adjusted position according to the dictates of the bicycle to be held. Each pair of L-shaped members has oppositely disposed inner bevelled surfaces and outer ribs for guiding a bicycle between them, which bicycle may roll up and over one of the tubes from either direction with the aid of ramp surfaces. The tubes are arranged to engage tread of the tire resting on the support surface and the L-shaped members are arcuate to engage the sidewalls of the tire for approximately 180° of its circumference. For further adjustability, cross pins are provided for smaller diameter tires.

3,603,460
APPARATUS FOR STORING PHONOGRAPH RECORDS
Robert J. Notes, Adrian, Mich., assignor to Lyle W. Roeder, Adrian, Mich., a part interest
Filed Sept. 15, 1969, Ser. No. 858,067
Int. Cl. A47g *29/00*
U.S. Cl. 211—40 **9 Claims**



A phonograph record storage container includes a frame with a plurality of parallel, elongate supports at the bottom thereof to individually support the records. The supports are pivoted at intermediate points and can be tilted downwardly toward the front to move the records outwardly for easy accessibility. The storage apparatus also includes unique wire dividers between the records which effectively separate adjacent records from one another regardless of their size. An indexing mechanism is mounted on the storage container for selectively tilting any one of the elongate supporting members downwardly to facilitate removal of a selected record.

3,603,461
RUG RACK
Leon H. Best, Galva, Ill., assignor to John H. Best & Sons, Inc., Galva, Ill.
Filed Dec. 4, 1969, Ser. No. 882,094
Int. Cl. A47f *7/16*
U.S. Cl. 211—47 **13 Claims**



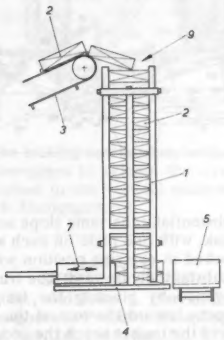
The rack displays rugs in a showroom and includes a plurality of rug hangers pivotally mounted at their upper ends on a hinge bar and at their lower ends on a pivot bar so that half of the rug hangers will normally move by gravity in one direction while the other half will normally move by gravity in the other direction to normally display the rugs hanging on the two centermost rug hangers.

3,603,462

TRANSFER ARRANGEMENT

Theo Moser, Stuttgart, Germany, assignor to Hofliger & Karg, Waiblinger bei Stuttgart, Germany

Filed Apr. 16, 1970, Ser. No. 29,167
Claims priority, application Germany, Apr. 17, 1969, P 19 19 521.2
Int. Cl. B65g 59/12
U.S. Cl. 214—8.5 A 6 Claims



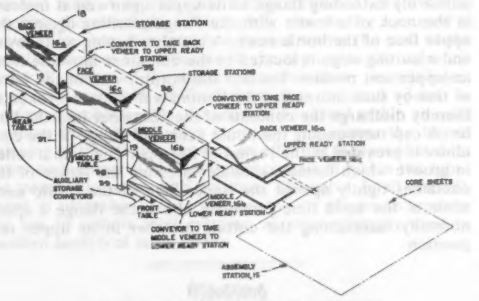
An upright hollow structure is mounted for pendulous movement about an axis intersecting it in the region of its upper end portion. A supply introduces a succession of discrete stackable articles into the upper end of the structure so that they form in the latter an upright stack. Receivers each having an inlet travel in the region of the lower end of the structure in a path paralleling the plane of pendulous movement thereof. An ejecting device moves with the structure and serves to eject through an opening provided in the lower end portion thereof a predetermined number of articles from the stack into the respective receivers when the inlets thereof are in registry with the outlet opening of the structure.

3,603,463

APPARATUS FOR FEEDING VENEER TO PLYWOOD ASSEMBLY STATION

Ronald J. Billett, Sunnyvale; Donald W. Chamberlin, Los Gatos, and Arthur L. McGee, San Jose, all of, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Apr. 1, 1969, Ser. No. 811,929
Int. Cl. B65g 60/00
U.S. Cl. 214—8.5 R 9 Claims


STORAGE STATION
CONVEYOR TO TAKE BACK VENEER TO UPPER READY STATION
STORAGE STATION
CONVEYOR TO TAKE FACE VENEER TO UPPER READY STATION
BACK VENEER, 16a
UPPER READY STATION
BACK VENEER, 16a
CORE SHEETS
MIDDLE VENEER, 16b
LOWER READY STATION
CONVEYOR TO TAKE MIDDLE VENEER TO LOWER READY STATION
ASSEMBLY STATION, 15

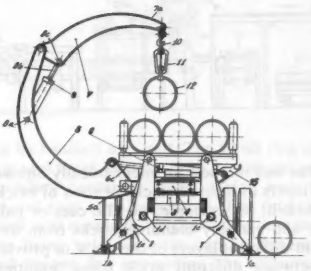
Apparatus for feeding veneer to a plywood assembly station is disclosed. The apparatus has three lift tables in line with the assembly station. The back lift table supports a supply of back veneer, the middle lift table supports a supply of face veneer, and the front lift table supports a supply of middle veneer. Two vertically stacked conveyors extend, respectively, from the outer two lift tables to lift tables to transport back veneer and face veneer, respectively, to an upper ready station. A third conveyor, below the other two conveyors, extends from the front lift table to transport middle veneer to a lower ready station. The back and face veneer are released together from the upper ready station to the assembly station, and the middle veneer is released alternately from the lower ready station to the assembly station.

3,603,464

UNDERCARRIAGE TRAILER FOR HANDLING AND TRANSPORTING ELONGATED BODIES

Gheorghe Marcel Teodorescu, Stirbei Voda, Romania, assignor to Interprinderea Montaje Conducte Magistrale, Brasov, Romania

Filed Oct. 1, 1969, Ser. No. 870,508
Claims priority, application Romania, Dec. 2, 1968, 58361
Int. Cl. B60p 1/48
U.S. Cl. 214—77 2 Claims



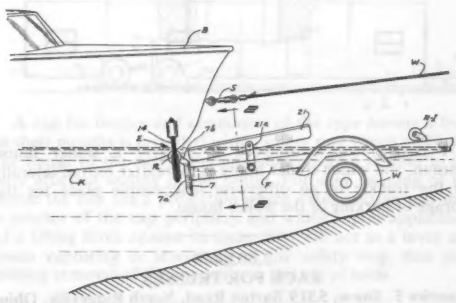
A trailer has an underslung carriage provided with a lifting installation for depositing elongated bodies upon the trailer and transferring them to and from the trailer. The installation comprises a pair of crescent-shaped articulated arms mounted upon a pivotal support and adapted to lift the elongated bodies for transfer purposes and to surround the bodies to retain them during transport.

3,603,465

BOAT CENTERING AND GUIDING DEVICE FOR BOAT TRAILERS

Kenneth J. King, 32 Penn Ave South, Minneapolis, Minn.

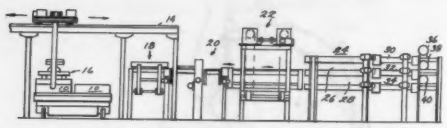
Filed Nov. 20, 1969, Ser. No. 878,293
Int. Cl. B60p 1/52
U.S. Cl. 214—84 5 Claims



A novel boat centering and guiding device closely cooperates with the frame, the centered keel-plate-receiving rollers and the winch and winch cable of most conventional types of boat trailers. The device or apparatus employs a pair of spaced oppositely arranged spring-tensioned roller elements mounted close to the respective ends of the trailer roller which first receives the bow of the boat in loading. Up-

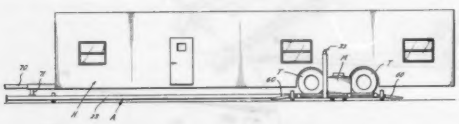
standing spring mechanisms on which said cooperating rollers are mounted are anchored at their lower ends somewhat below the axis of the receiving trailer boat-receiving roller so the first keel plate portion of the bow of the boat is yieldingly engaged thereby centering the boat relative to the length of the trailer and thereafter the springs yield to the configuration but continue to engage lower portions of the boat adjacent the keel plate thereof for assuring center guiding of the boat throughout its length upon the boat trailer.

3,603,466
METHOD FOR UNLOADING AND BLENDING LAYERED STACKS OF BRICKS OR SIMILAR ARTICLES
Hans M. L. Lingl, Jr., Paris, Tenn., assignor to Lingl-Bell Corporation, Gleason, Tenn.
Filed May 22, 1970, Ser. No. 39,707
Int. Cl. B65g *59/02*
U.S. Cl. 214—152 **8 Claims**



Apparatus and method for mechanically unloading a layer or double layers of layered stacks of rows of bricks or similar articles stacked, for example, on kiln cars or pallets and for selectively and variably blending bricks from different rows and/or from different layers of the stack to provide a blended balance between different brick firing qualities and/or to achieve special coloring effects in the final blended output. Bricks from one layer of the stack are stored on one of a plurality of storage levels and one or two rows of bricks from each level are separated and mixed with other separated rows of bricks from the same or other storage levels to achieve the desired blending pattern. Special handling also permits the mixing of bricks from less than a whole row of bricks from one layer with less than a whole row of bricks from another layer for increased flexibility in achieving any desired blend.

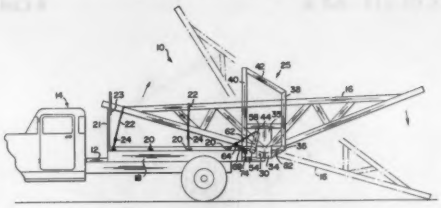
3,603,467
POWER TRUCKLE FOR TRAILER HOUSE
James H. Siler, Star Rte. A, Box 259, Hobbs, N. Mex.
Filed Apr. 10, 1969, Ser. No. 815,068
Int. Cl. B60b *29/00*
U.S. Cl. 214—334 **8 Claims**



A power truckle adapted to receive a trailer house thereon, and which trailer house is thereafter moved laterally on the truckle to an otherwise inaccessible place for the storage or parking of the trailer house.

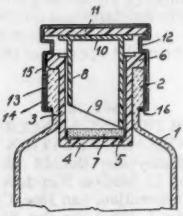
3,603,468
RACK FOR TRUSSES
Maurice F. Shave, 5319 Barton Road, North Ridgeville, Ohio
Filed July 24, 1969, Ser. No. 844,332
Int. Cl. B60p *1/04*
U.S. Cl. 214—501 **8 Claims**

A rack for carrying trusses in inverted position which includes a pair of substantially parallel side rails fixed to the bed of a conveyance. Upwardly extending standards at one end of the rails support the forward, end portions of the trusses; independently secured to the bed at the rear end of the rails is a rotatable frame which supports the central portions of the trusses; and the rear portions of the trusses extend beyond the rear of the conveyance. The frame is pivotably mounted on a shaft and includes a pair of lattice like side elements which project radially from the opposite ends of said shaft to provide lateral support for the trusses. Extending between the side elements are two sloping, bottom support plates which converge to form an open, V-shaped



trough having substantially the same slope as the trusses near their inverted peak, with one plate on each side thereof. The frame may be locked in carrying position with the V-shaped trough opening substantially upward. The trusses are dumped from the conveyance by pivoting the frame until the V-shaped trough opens toward the rear of the conveyance and the rear portions of the trusses touch the ground.

3,603,469
GUARANTEE CAP
Ambrogio Magni, Viale Monza, 210, Milan, Italy
Filed Feb. 20, 1969, Ser. No. 800,888
Claims priority, application Italy, Apr. 11, 1968, 8589B/68
Int. Cl. A45c *11/04*
U.S. Cl. 215—6 **4 Claims**

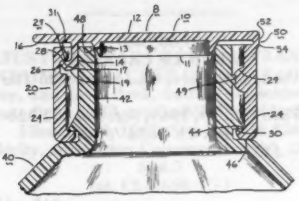


A container having a frangible bottom wall and radially outwardly extending flange at its upper open end is inserted in the neck of a bottle with the flange abutting against the upper face of the bottle neck. A member having at its lower end a cutting edge is located in the container movable from an upper rest position towards the bottom wall of the latter so that by such movement the bottom wall may be broken to thereby discharge the contents of the container into the bottle. A cap surrounding the bottle neck and flange of the container is provided in the region of its upper end with a rolled in groove which forms a shoulder pressing the flange of the container tightly against the upper face of the bottle neck while at the same time providing above the flange a space normally maintaining the cutting member in its upper rest position.

3,603,470
COMPRESSIBLE SAFETY CLOSURE
Donald F. Armour, Bloomfield, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Jan. 2, 1970, Ser. No. 248
Int. Cl. A61j *1/00;* **B65d** *55/02*
U.S. Cl. 215—9 **11 Claims**

A safety closure to prevent children from opening containers such as those holding medicines. The closure includes a skirt for fastening to the container, an overcap for sealing the container opening and a locking mechanism for securing

the overcap to the skirt. The skirt has a vertical section having a portion of the locking mechanism thereon and an adjoining outwardly flaring section. On pressing the outwardly



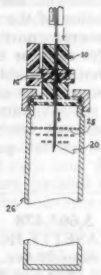
flaring section the locking mechanism, including a portion on the overcap, disengages to release the overcap, whereas a similar force applied to the vertical section of the skirt will not result in such disengagement.

3,603,471

SEPTUM VALVES

Rano J. Harris, Sr., and Rano J. Harris, Jr., both of Baton Rouge, La., assignors to Precision Sampling Corporation

Filed Nov. 24, 1969, Ser. No. 879,232
Int. Cl. B65d *51/00*
U.S. Cl. 215—37 **10 Claims**



Apparatus for containing fluids, i.e., liquids or gases, within a confined space. In one embodiment, the apparatus comprises a valve structure including a tubular member (with axial opening) which leads into an enclosed space which can contain fluid. A septum, and a stem, provided with a lateral opening therethrough, are integrally mounted or mounted in series. The stem is rotatably mounted within the wall of the tubular member for exposure of the septum to the valve exterior. Exposure of the septum in such manner permits injection or withdrawal of fluid from the enclosed space. In preferred embodiments, the septum is located within an axial opening through the valve stem and lies across the lateral opening of the stem to provide an effective leakproof seal. In other embodiments, the septum is contained within the tubular member in series with the stem. The valve, in all embodiment, is adaptable for use with containers of various types or for use in sample inlet systems, as conventionally used in modern analytical instruments.

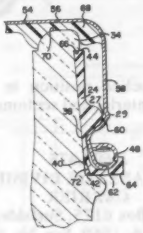
3,603,472

TRANSFERABLE FINISH RING AND CONTAINER AND CLOSURE FOR USE THEREWITH

Frank H. Lecinski, Jr., Harwood Heights, and James E. Westfall, Western Springs, both of, Ill., assignors to Continental Can Company, New York, N.Y.

Filed Mar. 5, 1969, Ser. No. 804,486
Int. Cl. B65d *41/08, 41/62*
U.S. Cl. 215—40 **12 Claims**

A finish ring or transfer fitment which may be transferred onto a container, preferably having a cap associated therewith at the time of transfer, in which the finish ring includes means for engaging a ring finish portion of the container, and further includes means for engaging a portion of the container to prevent rotational movement of the ring, and side finish means on a circumferentially extending portion thereof for receiving and retaining a closure member thereover so as to engage the container in a tight-sealing relation. Preferably, the ring also includes a bottom stop or bottom finish portion for locking the closure to the finish ring so



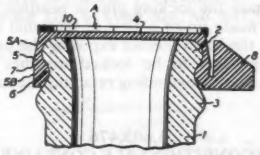
the two may be handled as a unit. The finish ring may further include a top seal finish portion, with or without an integrally formed secondary container cover, which may in turn include a tear-out easy opening section. The ring may also include separate seal means for engaging the container, as well as means for being held while the cap or closure is applied thereto, and means for preventing the closure from accidentally backing off from the ring or fitment before, during or after assembly.

3,603,473

CAPS FOR BOTTLES AND CONTAINERS

Ragnar Olof Winberg, Frontgatan 8c, 252 56 Halsingborg, Sweden

Filed Mar. 10, 1970, Ser. No. 18,170
Claims priority, application Sweden, Mar. 12, 1969, 3382/69
Int. Cl. B65d *41/22*
U.S. Cl. 215—41 **2 Claims**



A cap for bottles and containers of the type having a bead at their mouths is provided with a safety ring which embraces the flange of the cap in the mounted position thereof to ensure efficient sealing of the bottle. For easy opening of the bottle the cap has a projection which extends from less than a quarter of the cap periphery and which, upon application of a lifting force against its underside, will act as a lever and cause rupturing or stretching of the safety ring, thus permitting removal of the cap without the use of tools.

3,603,474

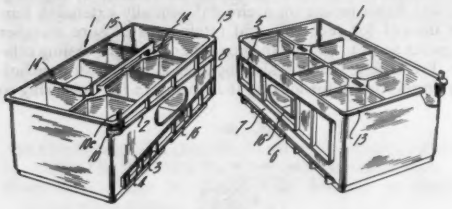
INTERLOCKING MEANS FOR DIVISIBLE CONTAINER CARRIER

Gerald Erickson, P.O. Box 6175, Surfside, Fla.

Filed June 16, 1969, Ser. No. 833,652
Int. Cl. B65d *21/02*
U.S. Cl. 220—23.4 **5 Claims**

A sectional carrying case capable of being interlocked with another sectional carrying case and having a finger-actuated

movable lock guided for movement between a release position in which it permits the case to be interlocked with

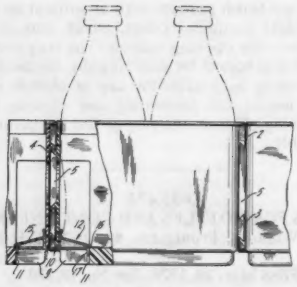


another case and a locked position in which it prevents separation of a pair of interlocked sectional carrying cases.

3,603,475
INTERLOCKING MEANS FOR DIVISIBLE CONTAINER CARRIER

Gerald Erickson, P. O. Box 6175, Surfside, Fla.

Filed June 16, 1969, Ser. No. 833,653
Int. Cl. B65d *21/02*
U.S. Cl. 220—23.4 **7 Claims**

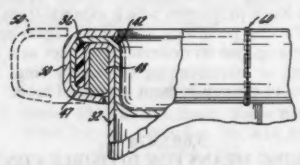


A locking clip for locking together a pair of sectional carrying cases to make up a composite carrying case and having retaining means extending outwardly from opposite sides of the clip to retain the locking clip in position. A composite carrying case made up of a pair of sectional carrying cases having slots in the bases thereof exposing the parts of the sectional carrying cases to be locked together and parts to receive the outwardly extending retaining means.

3,603,476
RECONDITIONABLE CONTAINERS

Mattheus J. M. Coppens, Erikalaan, Belgium, assignor to Inland Steel Company, Chicago, Ill.

Filed July 22, 1969, Ser. No. 843,678
Int. Cl. B65d *7/42*
U.S. Cl. 220—67 **13 Claims**

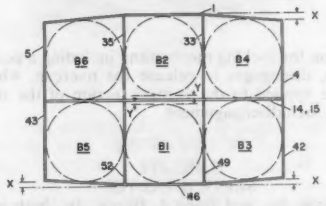


An improved multitrip metallic shipping container which permits repetitive use of the metallic container components while at the same time permitting unimpeded access into the interior of the container and into the normally inaccessible chime portions thereof for cleaning, dedenting and related container reconditioning purposes, and to methods of assembly and disassembly thereof. The positioning of a resilient sealing means, such as a gasket, relative to the cylinder body and a drum head provides a construction with improved resistance to leakage and deformation.

3,603,477
ARTICLE CARRIER

Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation

Filed Oct. 29, 1969, Ser. No. 872,320
Int. Cl. B65d *75/00*
U.S. Cl. 220—113 **5 Claims**

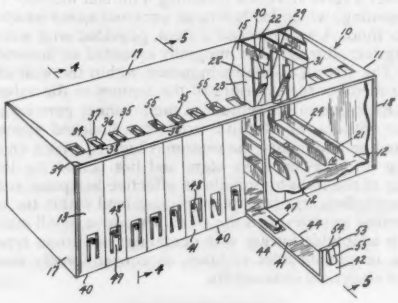


A basket style multiple cell article carrier having a low medial handle structure disposed between two rows of articles is specially constructed to provide hand gripping space on each side of the handle and intermediate the top portions of the middle ones of the packaged articles. Toward this end, the end wall panels are somewhat narrower in width than the exterior transverse dimension of the packaged articles while the intermediate transverse partitioning elements are somewhat longer than the exterior transverse dimension of the packaged items so that the middle article or articles on each side of the handle may be moved outwardly somewhat to afford hand gripping space immediately adjacent one or more hand gripping apertures formed in the handle and disposed below the tops of the packaged items midway between the ends thereof.

3,603,478
TAPE CASETTE HOLDER

Andrew S. Connan, 53 Roosevelt Ave., Glen Head, N.Y.

Filed Apr. 2, 1970, Ser. No. 25,193
Int. Cl. G07f *11/00*
U.S. Cl. 221—87 **5 Claims**



An integrally molded case, the interior of which is subdivided into a plurality of compartments, each capable of accommodating a tape casette or similar article. Each compartment includes an integrally molded spring engaging one end of the casette, and a hinged lid includes a second resilient element engaging an opposite end of the casette when in closed position, whereby the casette is cushioned against movement along its longest axis, and frictionally retained against movement within the compartment along an axis perpendicular thereto. The resilient means on the lid elements

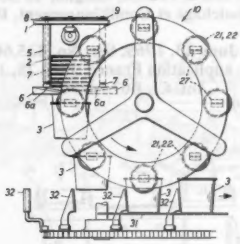
include a projection which normally extends outwardly from the outer surface of the lid element when the lid has been closed upon a compartment containing a casette, thereby giving tactile indication to the user of the presence of the casette within the compartment.

3,603,479

APPARATUS FOR SEPARATION AND TRANSPORTING OF CONTAINERS STACKED UP INTO EACH OTHER

Josef Kuster, and Josef Broll, both of Dusseldorf, Germany, assignors to Benz & Hilgers GmbH, Dusseldorf, Germany

Filed July 2, 1969, Ser. No. 838,526
Claims priority, application Germany, July 10, 1968, P 17 61 814.3
Int. Cl. B65h *3/32*
U.S. Cl. 221—210 **8 Claims**



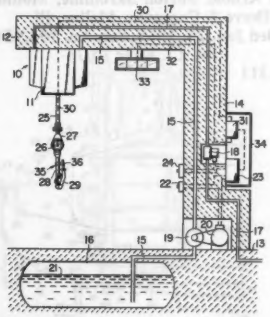
An apparatus for separation and transporting of containers of paper, cardboard, synthetic material foil or the like, which comprises separation means for a staple of containers. A feeding device includes substantially two conveyor wheels mounted horizontally and continuously rotating. A transporting device is provided and driving members are arranged laterally projecting from the conveyor wheels and having guide slots and pointing towards each other. The axis of the staple and the transporting device are disposed tangentially to the rotating path of the driving members. Means are arranged for causing an additional rotating movement of the driving members about their axis, whereby the guide slots of the driving members are parallel relative to each other in each moving phase of the conveyor wheels.

3,603,480

FUEL SUPPLYING APPARATUS

Yoshihiko Irie, Kawasaki; Mitsunori Nishizawa, Kawasaki, and Shunro Yamawaki, Tokyo, all of, Japan, assignors to Tokico Ltd., Kanagawa-ken, Japan

Filed June 27, 1969, Ser. No. 837,028
Claims priority, application Japan, July 2, 1968, 43/56,272
Int. Cl. B67d *5/30*
U.S. Cl. 222—20 **7 Claims**



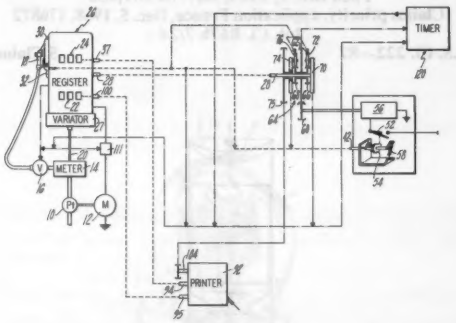
A fuel-supplying apparatus having a flowmeter and an indicator at a preferred location in a fuel-supplying conduit pipe suspended from above a fuel-supplying service area where vehicles are supplied fuel. The flowmeter and the indicator are provided at a location adjacent a delivery nozzle in the fuel-supplying conduit and readily observable by the operator supplying fuel with said nozzle in hand.

3,603,481

FLUID-DISPENSING APPARATUS CONTROL SYSTEM

Lawrence Dilger, South Croydon, and Ernest S. Ashford, Felbridge East Grinstead, both of, England, assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Sept. 29, 1969, Ser. No. 861,710
Claims priority, application Great Britain, Oct. 2, 1968, 46,717/68
Int. Cl. B67d *5/06*
U.S. Cl. 222—23 **16 Claims**



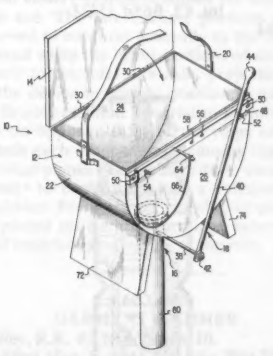
A gasoline pump having a control system with a constant speed electric drive motor connected to be energized when the pump is operated to deliver fuel and to remain energized until after the delivery of fuel is completed. One-turn mechanisms comprising drive ratchet wheels driven by the motor and driven ratchet pawls are adapted to be selectively engaged for resetting the pump register when the pump is operated to deliver fuel and for operating a printer after the completion of the fuel delivery to record the amount of the delivery. A timing counter driven by the constant-speed drive motor automatically terminates the delivery after a predetermined interval.

3,603,482

BODY SUPPORTED GRANULAR MATERIAL SPREADER

Tom Shelton, Box 102-B Rte. 1, Corbin, Ky.

Filed Aug. 6, 1969, Ser. No. 847,938
Int. Cl. B67d *5/22*
U.S. Cl. 222—43 **4 Claims**



A body supported granular material spreader is provided by a container which receives the granular material. The bottom wall of the container communicates with a depending outlet conduit having a butterfly-type valve mounted therein. The butterfly valve is actuated by a lever and cooperating stop means associated with a wall of the container and with

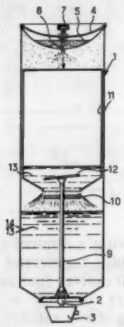
the lever permit opening of the spreader valve between a closed position and a full open position at a plurality of intermediate positions. The spreader is also provided with depending legs which extend a distance greater than the length of the outlet conduit so that the spreader is self-supporting when it is not in use or for filling purposes.

3,603,483

DEVICE FOR STORING TWO PRODUCTS SEPARATELY AND DISPENSING THEM SIMULTANEOUSLY

Bruno Morane, Paris; Charles Paoletti, Aulnay Sous Bois; Manlio Maurelli, Vaujours; Louis Merrien, Fontenay Sous Bois, and Robert Sathicq, Villepinte, all of, France, assignors to L'Oreal, Paris, France

Filed Dec. 1, 1969, Ser. No. 881,080
Claims priority, application France, Dec. 5, 1968, 176872
Int. Cl. B67b *7/24*
U.S. Cl. 222—82 **5 Claims**



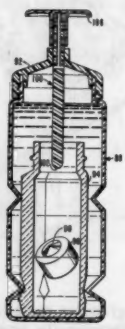
A device comprising a jacket having a valved end and holding a first product, a container holding a second product slidable within said jacket and in sealing contact with the jacket walls, means for propelling said container toward said valved end, and a rod positioned to open an orifice in said container as it approaches the valved end of said jacket.

3,603,484

A TWO-COMPARTMENT MIXING AND DISPENSING DEVICE

Robert W. Ogle, Newport Beach, Calif., assignor to Mix-O-Matic Corporation, Wilmington, Del.

Filed Feb. 28, 1969, Ser. No. 803,306
Int. Cl. B65d *35/22*
U.S. Cl. 222—94 **5 Claims**



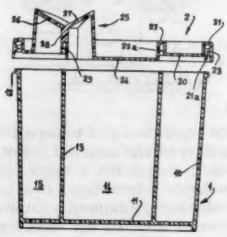
This patent describes a self-contained, two-compartment mixing device comprising an outer container adapted to contain a fluid, and having a fluidtight end closure, an inner container received in said outer container, said inner container having an end closure, said end closure of said inner container facing said end closure of said outer container to isolate the contents of the inner container from the contents of the outer container. In a preferred embodiment of this invention, the end closure of the outer container is provided with a projection having cutting terminal surfaces extending from said end closure inwardly into said outer container, said sharp projection having cutting terminal surfaces being adapted to be compelled toward and through the end closure of said inner container by longitudinal compression of said outer container to establish fluid communication between said inner and outer containers.

3,603,485

CONTAINERS

Georges Vivier, Yzeure, France, assignor to Societe Astra de Bouchage, Surboichage et Conditionnement, Rhone, France, a part interest

Filed June 23, 1969, Ser. No. 835,600
Claims priority, application France, June 28, 1968, 50,169
Int. Cl. B67d *5/56*
U.S. Cl. 222—129 **2 Claims**



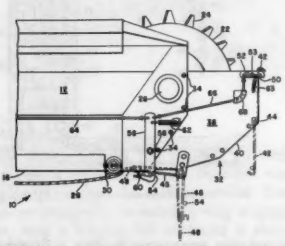
A container for two products which must be kept separately from each other, but which should be mixed at the time of use, comprises a body having an open upper end and a lower bottom provided with an upwardly extending partition to determine two separate chambers. A cover closes both chambers in a fluidtight manner and it includes a upwardly directed hollow extension having an inner dividing partition which delimits therein two subspaces each communicating with one of the chambers. At the time of use this extension is cut horizontally below its closed upper end and it thus forms a double discharging spout for the contents of both chambers.

3,603,486

ENDGATE AND ENDGATE CLOSURE MECHANISM FOR A MATERIAL UNLOADER

J. Clark Fickle, Moline; Paul Julius Thornbloom, East Moline, and Arnold Burton Skromme, Moline, all of, Ill., assignors to Deere & Company, Moline, Ill.

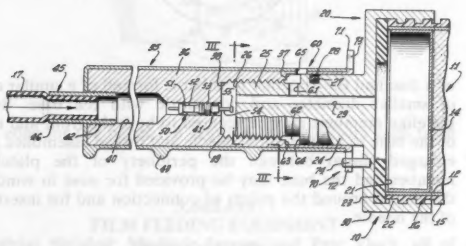
Filed Jan. 29, 1969, Ser. No. 794,951
Int. Cl. A01c *15/16*
U.S. Cl. 222—311 **20 Claims**



An endgate for conventional manure spreader box which is mounted adjacent the beater and includes a rear and bottom pivotally mounted doors. A spring biased latch is provided to

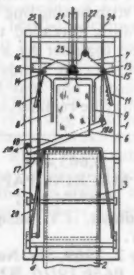
hold each door closed against the force of gravity tending to open them and a single cable extends from the latches to the front of the spreader box to be pulled by the operator to release the latches for selectively allowing the rear door to open for providing additional clearance for the beater and for allowing the bottom door to open to enable the spreader box or conveyor to expel the last of the material from the spreader box.

3,603,487
IN-LINE SEALANT DISPENSER
Ralph J. Cook, Torrance, Calif., assignor to Products Research and Chemical Corporation, Burbank, Calif.
Filed Nov. 17, 1969, Ser. No. 877,280
Int. Cl. B65d *83/00*
U.S. Cl. 222—389 **13 Claims**



An in-line sealant dispenser has a socket member receiving the rear end of a cartridge assembly containing sealant to be selectively dispensed therefrom by air pressure, and a rearwardly extending manually rotatable control handle member threaded onto a coaxial boss on the socket member, axially in line with said cartridge, for axial movement relative to said socket upon rotation relative thereto to open and close a valve in the control handle member to regulate the flow of air from an airhose through said handle and socket member air passages to the rear end of the cartridge assembly to selectively dispense the sealant from the dispenser.

3,603,488
APPARATUS FOR MECHANICALLY FOLDING INWARDLY AND CUTTING AN END PORTION OF A LENGTH OF TUBULAR FLEXIBLE MATERIAL
Svend Sigurd Christie Fleischer, Klampenborg, Denmark, assignor to Gustavsson, Pertti, Boras, Sweden
Filed Dec. 4, 1969, Ser. No. 882,062
Claims priority, application Denmark, Dec. 12, 1968, 6066/68
Int. Cl. A41h *33/00, 43/00*
U.S. Cl. 223—37 **4 Claims**



An apparatus is provided for mechanically and successively folding over within itself the end portion of a length of tubular flexible material and thereafter severing the doubled tubular portion from the tubular material. The apparatus includes hollow guide means adapted to concentrically receive the flexible tubular material thereabout, folding means for successively folding over within said guide means the end portion of the tubular material, and grasping means for grasping the double portion of tubular material and for longitudinally displacing said material to an axially displaced position wherein cutting means sever the doubled end portion.

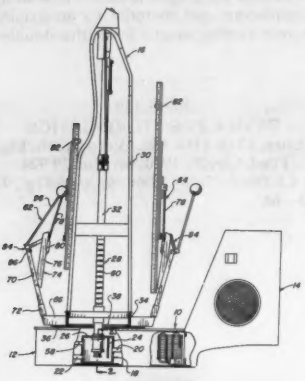
3,603,489
DEVICE FOR STORING WIGS
Olive E. Fleisher, 1216 11th Ave., Vero Beach, Fla.
Filed Apr. 20, 1970, Ser. No. 29,924
Int. Cl. D06c *15/00;* **D06f** *59/00;* **A47g** *29/08*
U.S. Cl. 223—66 **11 Claims**

A collapsible wig storing device including upper and lower horizontally disposed rings and a plurality of elongated ribs having apertures in opposite end portions thereof receiving said rings to permit said ribs to be moved angularly around the rings between spaced-apart positions for use in supporting a wig and closely spaced positions for storing the device when not in use. The intermediate portions of the ribs are convexly curved to conform generally to the configuration of a person's head while the lower portions of said ribs are concavely formed to provide outwardly projecting portions for supporting the device in upright position in use. The ribs are made from flexible resilient material to permit two groups of ribs located on opposite sides of the rings to be moved inwardly towards each other thereby causing the rings to move out of horizontal planes causing the ribs in each of the groups to move closer to each other into a collapsed position for storing the device. Preferably, a plurality of coil compression springs are placed on each of the rings between the ribs to facilitate and maintain positioning of the ribs.

3,603,490
GARMENT FINISHER
Lloyd W. Killey, R.R. #2 Monmouth, Ill.
Filed Mar. 6, 1969, Ser. No. 804,767
Int. Cl. D06f *73/00*
U.S. Cl. 223—70 **4 Claims**

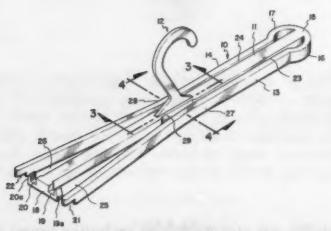
A garment finisher provided with structure in the steam vessel for heating the conditioning fluid to dry the fluid. A transversely C-shaped baffle in an annular chamber permits selective varying of the path of flow of the fluid over a heated wall to thereby control the temperature of the conditioning

fluid. A bayonet clamp mount permits ready removal of the clamp and a manually operated spring assembly including a



cam closes or opens the clamp for installation or removal of a garment.

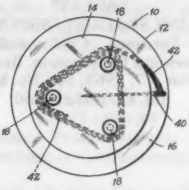
3,603,491
TROUSER AND SKIRT HANGER
Wilford A. Weight, 2333 Logan Circle, Salt Lake City, Utah
Filed Nov. 19, 1969, Ser. No. 878,058
Int. Cl. A47j *51/14*
U.S. Cl. 223—96 **10 Claims**



A clothes hanger adapted to hold trousers, skirts, and the like, preferably molded from a plastic material. An elongate, rigid support bar is provided with a suspension hook adapted to extend from its upper surface intermediate its length so as to hang in horizontal position from a clothes rack. A pair of elongate clamping bars have one set of ends flexibly attached to an end of the support bar for hinge action, and extend along the length of the support bar on opposite lateral sides thereof. Hinge action is achieved by reason of the flexibility of the material forming an outwardly curved portion of the clamping bars at the point of attachment. The opposite ends of the clamping bars and the support bar have latching means for latching the clamping bars in clamping position relative to the support bar so as to hold the men's trousers or other items securely between the clamping bars and the support bar. The clamping bars can have a slight outward bow from approximately midlength to the free ends of the bars for achieving a firmer clamping action on the trousers when the bars are latched to the support bar.

3,603,492
NEEDLE AND THREAD HOLDER
Socrates J. Schantz, Marine, Ill., assignor to John S. Schantz and Raymond G. Schantz, Marine, Ill., part interest to each
Filed Apr. 13, 1970, Ser. No. 27,816
Int. Cl. A41h *31/00*
U.S. Cl. 223—109 R **12 Claims**

A needle and thread holder for odd lengths of thread, left in a needle after a sewing operation. The holder comprises a flat base to which is connected a platelike member closely held to the base by at least two and preferably three points of connection located interiorly of the periphery of the platelike member. The thread is adapted to be wound around the points of connection and the needle is inserted between the points of connection radially into the center of the assemblage between the platelike member and the base and held therein by friction. In preferred form, the base is in the form



of a disc and the platelike member is formed of a similar disc of smaller diameter and concentric with the base. Such platelike members may be secured to both the front and rear of the base to hold multiple needle and thread assemblies. An enlarged throat between the periphery of the platelike member and the base may be provided for ease in winding the thread around the points of connection and for insertion of the needle.

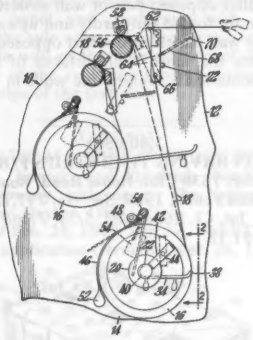
3,603,493
BRACELET, ESPECIALLY FOR A WATCH
Jacques Frohlich, Geneva, Switzerland, assignor to Etablissements Industriels Pierre A. Derobert & Cie, Geneva, Switzerland
Filed Aug. 12, 1969, Ser. No. 849,430
Claims priority, application Switzerland, Aug. 23, 1968, 12732/68
Int. Cl. A44c *5/00*
U.S. Cl. 224—4 D **8 Claims**

A bracelet, primarily for attachment to watches, comprises a pair of apertured metallic strips which may or may not be hinged together, each strip having one or more flexible bands of metal, plastic or fabric threaded through the apertures. The strips are fastened together by a fastening device connecting the ends of the flexible bands. The bands may have decorative designs thereon and may be of circular or oval shape. The apertures may be rectangular.

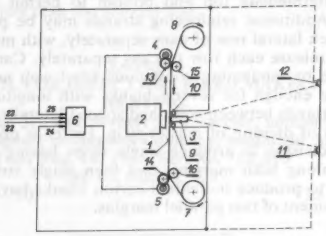
3,603,494
DIAZO COPYING MACHINE PAPER SUPPLY ROLL HANDLING
Arnold G. Ulmer, Endicott, N.Y., assignor to GAF Corportion, New York, N.Y.
Filed July 2, 1969, Ser. No. 838,412
Int. Cl. B65h *19/10;* **B26f** *3/00*
U.S. Cl. 225—89 **2 Claims**

Fresh rolls of paper are loaded in a diazo copying machine by placing each new roll in a mandrel assembly having a shaft provided with wheels which are placed on downwardly inclined rails that guide the assembly into place when the wheels automatically are locked, and from which the paper is drawn while continuously braked until the roll is near exhaustion whereupon an electric switch is automatically

operated, stopping further operation pending replacement. A paper tearoff device is also provided to assure straight leading edge for the paper fed into the machine from each fresh roll.



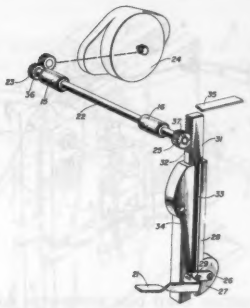
3,603,495
FILM FEEDING EQUIPMENT
Bretislav Stejskal; Vladimir Stepan, and Petr Vlach, all of Prague, Czechoslovakia, assignors to Tesla, Narodni Podnik, Prague, Czechoslovakia
Filed Jan. 9, 1969, Ser. No. 790,044
Claims priority, application Czechoslovakia, Jan. 12, 1968, Jan. 12, 1968, 242-68; 243-68
Int. Cl. G11b *15/20*
U.S. Cl. 226—33 **9 Claims**



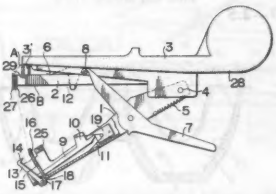
The invention relates to a film-feeding device for advancing a perforated or unperforated film strip of any width by any number of frames in either direction. The feeding of the film strip is effected by means of friction drive powered by two reversing motors. The advancement and braking of the film strip is carried out by variously supplying power to the two reversing motors. The displacement as well as the required positioning of the film strip are determined by sensing synchronizing indicia on the film strip by photoelectric sensors. The two reversing motors are switched from a rest condition to working and braking conditions by a special motor control device which is actuated either by starting signals from a primary source effecting the forward or reverse movement of the film strip or by stopping signals set up by the photoelectric sensors sensing the synchronizing marks.

3,603,496
RECORDER DRIVE MEANS
Milton Alden, Needham, Mass., assignor to Alden Research Foundation, Brockton, Mass.
Filed May 19, 1969, Ser. No. 825,845
Int. Cl. B65h *17/20*
U.S. Cl. 226—117 **4 Claims**

Recorder apparatus making use of a strip of electrosensitive paper for producing a visual image in response to variations in electrical signal current, a feed means for movement of the strip driven by a motor to move the feed means at a first slow speed and an actuator connected to the feed means to drive it selectively at a second rapid speed.



3,603,497
BINDER FOR GRAPE VINES
Mitsuo Nishikawa, Fujioka-shi, Japan, assignor to Max Corporation, Tokyo, Japan
Filed Dec. 12, 1969, Ser. No. 884,663
Claims priority, application Japan, Dec. 25, 1968, 43/95768
Int. Cl. B25c *5/00;* **B27f** *7/00;* **B21f** *15/06*
U.S. Cl. 227—76 **8 Claims**



The binder of the present invention comprises:

Connecting the pin frame containing the base and pin to the presser at the rear end thereof to the effect that said pin frame and the presser can be freely opened by the operation of the handle.

Said presser has tape containing portion, and the tape is drawn out with slight opening and closing force of said handle and is stuck between the end of the base and that of the pin frame.

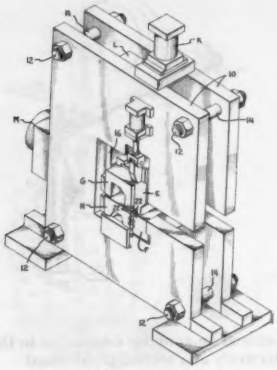
Thus, grape vines and supporting shelf are inserted in between the base and the pin frame on which tape is stuck, and when the handle is forcibly closed, the grape vines and the supporting shelf are unitedly bound, and the end portion thereof is held with pin, and the tape is cut off with the cutting edge, and the end portion of the tape is slightly lowered from the front end portion of said pin frame by means of opening operation of the handle, and then said tape is taken out of the following slight closing operation of the handle and it is stuck thereon.

By repeating such handle operation as above, the grape vines are bound with tape on the supporting shelf.

3,603,498
SHEET METAL WELDING MACHINE
Lloyd A. Cook, 3468 Roseland Ave, Parkersburg, W. Va., and Lewis W. Buell, 1693 Carey Drive, Charleston, W. Va.
Filed June 13, 1968, Ser. No. 736,635
Int. Cl. B23k *1/00, 37/04*
U.S. Cl. 228—4 **4 Claims**

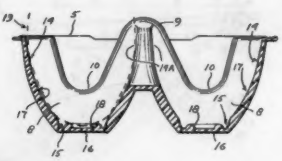
A heated fusion-bonding sheet metal press having a pair of stationary C-shaped metal frames arranged parallel to one another. Disposed between the two frames is a movable second C-shaped metal frame. Die holders associated with

the stationary frames and movable frame are mounted for vertical movement. Heating means associated with the die



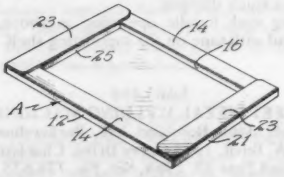
holders raise the temperature of the sheet metal to below its fusion temperature.

3,603,499
EGG CARTON CELLS
Gerald A. Snow, 5 Pine Ridge Road, Cumberland Foreside, Maine
Filed June 5, 1969, Ser. No. 830,606
Int. Cl. B65d *1/00*
U.S. Cl. 229—2.5 **7 Claims**



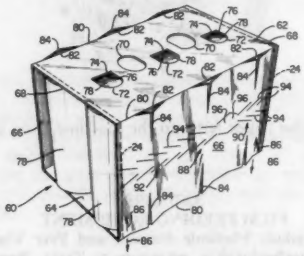
Egg receiving cells of egg cartons are disclosed that have a funnel portion, a closed bottom end portion, and an intermediate portion defining with the bottom end portion an annular support for the lower end of an egg, the upper end of which is in contact with the funnel portion. Desirably the cell wall is thicker in the intermediate portion than it is in the funnel portion.

3,603,500
HOLLOW WALLED TRAY
Daniel P. Dutcher, St. Paul, Minn., assignor to Hoerner Waldorf Corporation, Ramsey, Minn.
Filed June 16, 1969, Ser. No. 833,376
Int. Cl. B65d *5/22, 5/36*
U.S. Cl. 229—34 HW **3 Claims**



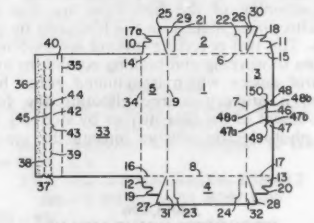
A hollow walled tray is provided including a generally rectangular bottom panel, and wall structures hinged to the side and end edges thereof. Each wall structure includes an outer wall panel, a top wall panel, an inner wall panel, and a glue flap. The wall structures are all folded inwardly to overlie the bottom, with the ends of the top panels of one opposed pair of wall structures overlying the ends of the top panel of the other opposed pair of wall structures. When the wall structures are folded outwardly and upwardly into erect form, the inner wall panels of the first opposed wall structure engage between the inner wall surfaces of the other wall structures, automatically locking the walls in hollow tubular relation.

3,603,501
CARTON HAVING TEAR STRIPS FOR CANS
Robert E. Confer, 7338 Club House Road, Boulder, Colo.
Filed Feb. 6, 1969, Ser. No. 797,180
Int. Cl. B65d *5/02, 5/54, 71/00*
U.S. Cl. 229—51 TS **8 Claims**



Open end carton of "six-pack" type has longitudinal slits on corner edges, one for each can. End slits tend to tear through to end margin, releasing cans. Reinforcing strand surrounds each end of container adjacent to margin, and its tensile strength prevents tearing. Tear strip is cut through strand intermediate top and bottom to permit intentional release. Additional reinforcing strands may be provided to retain each lateral row of cans separately, with multiple tear strips to release each row of cans separately. Carton blanks are made by laminating continuous label web and backing web wide enough for several blanks with longitudinal reinforcing strands between webs and spaced laterally at margins and lines of division of master strip. Latter is divided along lines of division to produce single strips having reinforcing strands along both margins, and then single strips are cut laterally to produce individual carton blanks having lines of reinforcement of two parallel margins.

3,603,502
RECLOSABLE CARTON
Sam B. Howard, Smyrna, and Kendrick E. Black, Atlanta, both of, Ga., assignors to The Mead Corporation
Filed June 3, 1969, Ser. No. 830,010
Int. Cl. B65d *5/54*
U.S. Cl. 229—51 TC **3 Claims**



A container having a base portion including a bottom wall and a plurality of sidewalls foldably joined to the side edges of the bottom wall is provided with a cover portion which includes a top panel and a closure panel secured to an edge of the top panel. The closure panel when closed is affixed to

one of the sidewalls of the base portion of the container along the edge of the closure panel remote from the top panel and a tear strip which is longitudinally disposed in the closure panel is provided for opening the carton in conventional fashion. A reclosing tab is formed in the upper portion of the closure panel and cooperates with holding tabs disposed along the side edges of a reclosing notch formed in the adjacent side wall of the base portion of the container. The lower edge of the reclosing tab substantially coincides with the upper edge of the tear strip.

3,603,503

AUTOMATIC MACHINE CONTROL DEVICE

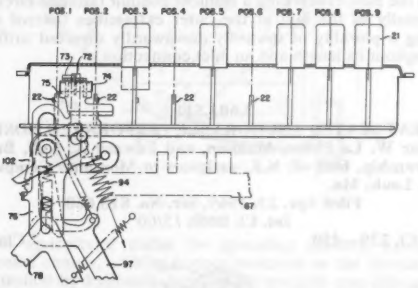
Bernhard O. A. Kasper, and Friedrich Rombach, both of Augsburg, Germany, assignors to The National Cash Register Company, Dayton, Ohio

Filed Feb. 25, 1969, Ser. No. 802,072

Claims priority, application Germany, Apr. 26, 1968, P 17 74 182.1

Int. Cl. G07g *1/00*

U.S. Cl. 235—7 A **7 Claims**



A mechanism for disabling the operation of a change-computing cash register whenever the amount tendered by the customer is less than the amount due.

3,603,504

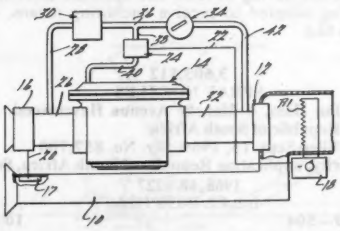
CONTROL FOR DIRECT GAS FIRED MAKEUP AIR HEATING

Charles Stang, Jr., and Herbert J. Schlachter, both of Detroit, Mich., assignors to Maxitrol Company, Southfield, Mich.

Filed Aug. 14, 1968, Ser. No. 752,599

Int. Cl. G05d *23/24*

U.S. Cl. 236—10 **21 Claims**



A control system for use on direct-fired makeup air heating systems utilizing a pilot-operated modulating valve providing a system which is rapid in response and in which hunting is minimized.

3,603,505

TRACK ASSEMBLY FOR TOY VEHICLES

Noriyuki Tsugawa, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan

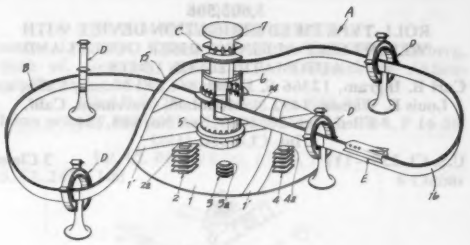
Filed Mar. 4, 1969, Ser. No. 804,128

Claims priority, application Japan, Aug. 29, 1968, 43/74,603

Int. Cl. A63h *19/30, 19/36, 21/04*

U.S. Cl. 238—10 E **3 Claims**

This invention, which encompasses a toy track system of an elevated railroad type, comprises a closed track for toy vehicles, said track being made up of a plurality of different forms of track sections each formed in an elongated boxlike hollow structure with its lower side opened, and a plurality of



support means for supporting said track sections, said support means also serving as connecting means for said track sections.

3,603,506

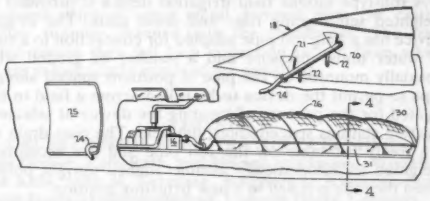
UNIVERSAL CHEMICAL DELIVERY SYSTEM

Charles H. Hubbs, Camp Springs, Md., assignor to Allan M. Lowe, Silver Spring, Md. and Ralph J. King, Annandale, Va., part interest to each

Filed May 2, 1969, Ser. No. 821,201

Int. Cl. B05b *17/02*

U.S. Cl. 239—1 **3 Claims**



A system is disclosed for dispensing of chemicals from an airplane while in flight to a predetermined area at ground level. The material to be dispensed is stored in a collapsible or deflatable storage means removably positioned within the load space of an airplane. A suitable pumping means may be connected to the storage means and communicates with a spray nozzle assembly detachably affixed to the wing or tail assembly of the airplane for distributing the airborne material over the predetermined ground area.

3,603,507

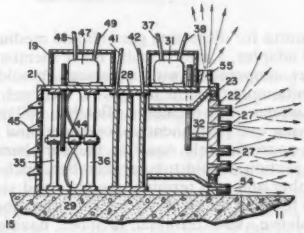
ATMOSPHERIC SNOW-MELTING AND FOG-DISPERSAL APPARATUS

James E. Devlin, 80 Salisbury St., Worcester, Mass.

Filed June 23, 1969, Ser. No. 835,337

Int. Cl. E01h *13/00*

U.S. Cl. 239—14 **7 Claims**



This invention has to do with an apparatus for the treatment of the atmosphere and, more particularly, to apparatus

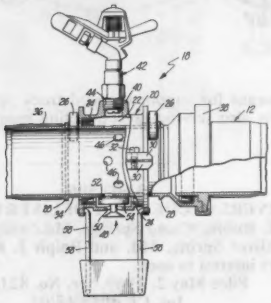
for the melting of snow in the air and the dispersal of fog and consisting of units for projecting streams of hot air in a predetermined pattern in the space to be treated.

3,603,508

ROLL-TYPE FIELD IRRIGATION DEVICE WITH WEIGHT SELF-ALIGNING RISER OUTLET AND AUTOMATIC DRAIN UNITS

Carl B. Ingram, 12366 S. Elliott Ave., El Monte, Calif., and Louis E. Watson, 1492 N. Mountain, Claremont, Calif.

Filed Mar. 20, 1969, Ser. No. 808,784
Int. Cl. B05b *15/02*
U.S. Cl. 239—111 **3 Claims**



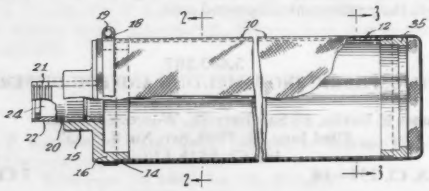
A roll-type mobile field irrigation device is provided with weighted self-aligning riser and drain units. The irrigation device has a long roll pipe adapted for connection to a supply of water under pressure and a number of ground wheels coaxially mounted on the pipe at positions spaced along the pipe to permit the device to be rolled across a field to be irrigated for the purpose of locating the device at selected irrigation stations spaced about the field. The riser drain units are freely rotatable on the roll pipe and are eccentrically weighted to automatically assume aligned upright positions when the pipe is rolled to a new irrigating position.

3,603,509

GAS DISPERSING APPARATUS

Leonard M. Nechine, Highland Park, Ill., assignor to FMC Corporation

Filed Feb. 24, 1970, Ser. No. 14,255
Int. Cl. B01d *47/02*
U.S. Cl. 239—145 **3 Claims**



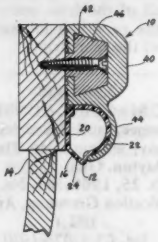
An apparatus for dispersing gas in liquid mediums comprising a rigid adapter, a rigid tubular inner member secured to the adapter cooperating with a passage in said adapter to form a continuous conduit for gas, a terminal member for said rigid tubular inner member, a flexible, collapsible porous sleeve, having one permanently closed end and a peripheral dimension approximately equal to the peripheral dimension of a cross section of said tubular member, enclosing said tubular member and said terminal member and secured to the adapter to form an air chamber between the tubular member and the sleeve, said terminal member having means for passage of gas between the interior of the tubular member and the closed end of said sleeve and separate communication means connecting the closed end of said sleeve and the longitudinally extending space between the sleeve and said tubular member.

3,603,510

PROTECTIVE HULL WASHER

William Wagner, Miami Beach, Fla., assignor to Watsco, Inc., Hialeah, Fla.

Filed Oct. 8, 1969, Ser. No. 864,620
Int. Cl. B05b *15/06*
U.S. Cl. 239—282 **1 Claim**



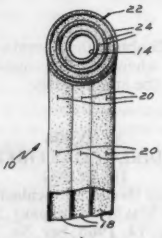
A molding or rub rail for boat hulls which is adapted to wash the hull, comprising a resilient conduit fastened circumferentially of the hull at the outer extremities thereof and having a plurality of inwardly downwardly directed orifices throughout its length and an inlet connection.

3,603,511

HEAT SEATED ANCHORABLE PERFORATED HOSE

Arthur W. La Pierre, Madison, and Edward A. Kull, Brick Township, both of, N.J., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 23, 1969, Ser. No. 818,660
Int. Cl. B05b *15/00*
U.S. Cl. 239—450 **7 Claims**



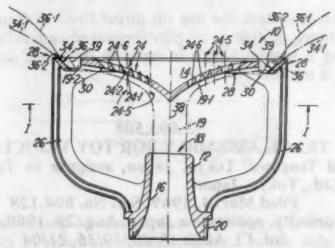
An improvement in a perforated hose comprising a heat seal at one end thereof in combination with a substantially flat disc portion having at least one aperture therethrough, thereby being adapted to receive anchoring means, e.g., a spike or the like.

3,603,512

SPRAY NOZZLES

Alexander Jan Ham, 6 Blanche Avenue Havenwood, Johannesburg, Republic of South Africa

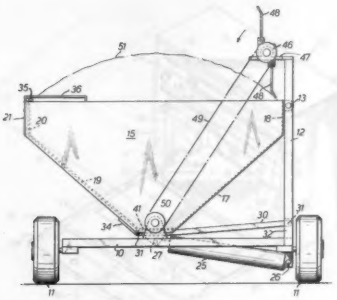
Filed Sept. 15, 1969, Ser. No. 857,700
Claims priority, application Republic of South Africa, Sept. 25, 1968, 68/6227
Int. Cl. B05b *1/26*
U.S. Cl. 239—504 **10 Claims**



The invention is directed to a method of forming a spray, to a spray nozzle and to a method of making a spray nozzle.

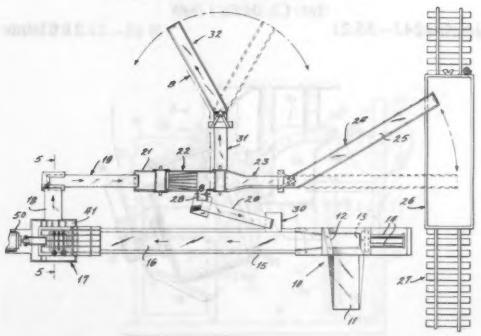
The method of forming a spray includes the step of directing a jet of liquid onto an apertured diffuser element of coniform which diverges in the flow direction of the jet of liquid. The spray nozzle includes a nozzle and an apertured diffuser element of coniform opposite the nozzle outlet and diverging away from the nozzle. The invention also shows that an annular deflector element is provided around the diffuser element.

3,603,513
MANURE SPREADER
Gwynfor Maple Harries, Efail, Blaenannerch, Cardiganshire, England
Filed Mar. 23, 1970, Ser. No. 21,874
Int. Cl. A01c *3/06*
U.S. Cl. 239—657 **15 Claims**



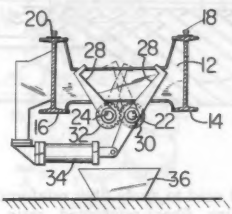
An agricultural trailer for spreading manure, having a wheeled chassis, a tilting hopper mounted on the chassis and controlled by hydraulic jacks to tilt towards one side and a rotary power operated flail impeller mounted on a fixed axis adjacent the discharge side of the hopper to throw out the manure as the hopper is tilted. Within the hopper is a movable wall connected to the chassis to move automatically towards the flail impeller as the hopper tilts.

3,603,514
SCRAP REDUCING AND REFINING APPARATUS
Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher & Pulverizer Co., Inc., St. Louis, Mo.
Filed July 28, 1969, Ser. No. 845,346
Int. Cl. B02c *13/04, 21/00*
U.S. Cl. 241—31 **8 Claims**



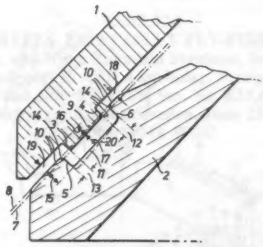
Apparatus for reducing scrap material, such as automobile bodies and waste objects of a bulky and space consuming character, in a unified plant that is operable on a continuous schedule to reduce the scrap to convenient sizes in advance of processing the same through a shredding mill and thence to apparatus for densifying the output of the shredding mill, and for recycling oversize portions of the product for further shredding treatment so that substantially all of the usable scrap may be recovered and separated from those portions that are not usable.

3,603,515
FRAGMENTING SCRAP METAL
Gunther Lohmann, Egisee, and Alfons Guminski, Amberg, both of, Germany, assignors to Luitpoldhutte Aktiengesellschaft, Amberg, Germany
Filed Feb. 28, 1969, Ser. No. 803,352
Claims priority, application Germany, Mar. 1, 1968, P 16 08 344.6
Int. Cl. B02c *18/00, 13/00, 19/12*
U.S. Cl. 241—100 **6 Claims**



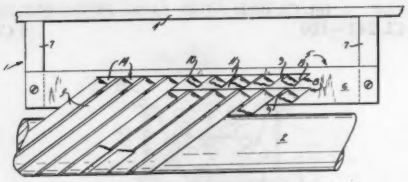
Fragmenting elongated pieces of scrap metal by means of multiple number of arms operating in scissorlike fashion. The fragmenting apparatus is mounted on the framework of a centrifugal casting machine and acts periodically to break accumulated strips of scrap metal dumped from the casting machine running channel onto the framework. The fragmented pieces then fall to a collection trough from which they are subsequently removed for remelting.

3,603,516
CRUSHER TOOL FOR GYRATORY CRUSHERS
Hanns Decker, Koln-Rath, and Helmut Stockmann, Wesseling Bei Koln, both of, Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany
Filed Dec. 16, 1969, Ser. No. 885,467
Claims priority, application Germany, Dec. 21, 1968, P 18 16 359.2
Int. Cl. B02c *2/04*
U.S. Cl. 241—293 **9 Claims**



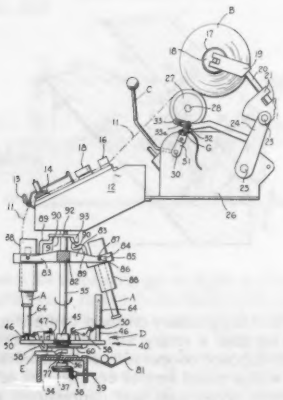
A crusher tool for gyratory crushers comprising a stationary crushing ring and a rotary and tumbling crushing cone which on their opposed cooperating conical working surfaces are provided with a novel type of cooperating concentrically arranged annular projections and depressions, respectively. The annular projection on the crushing ring in cross section is rectangular with rounded corners and is adapted to enter into a correspondingly shaped annular depression formed in the crushing cone, except that the vertical flanks of the projection are spaced from the vertical walls of the depression in the crushing cone. The height of the annular projection on the crushing ring is at equal or greater than the depth of the associated annular depression in the crushing cone.

3,603,517
FIBER BAND REGULATOR FOR FIBERGLASS PIPE WINDER
William N. McDonald, and William M. Hogan, both of Little Rock, Ark., assignors to A. O. Smith Corporation, Milwaukee, Wis.
Filed Jan. 14, 1969, Ser. No. 790,925
Int. Cl. B65h *27/00, 81/08*
U.S. Cl. 242—7.23 **4 Claims**



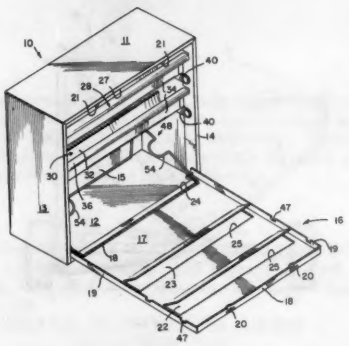
A delivery head used to apply fiber reinforcing bands to a mandrel in making fiber reinforced resin pipe has a reciprocating carriage supporting a regulator head for feeding the bands to the mandrel. The regulator head has a plurality of band regulator sets comprising generally triangular openings through the regulator head, and spaced longitudinally along the mandrel forming a pattern through which the separate fiber bands are applied to the mandrel in a continuous wide band.

3,603,518
MONITORING APPARATUS FOR A TEXTILE WINDING MACHINE
John M. Cochran, Jr., and Martin F. O'Brien, both of Greenville, S.C., assignors to Frontier Electronics, Inc., Greenville, S.C.
Filed June 23, 1969, Ser. No. 835,559
Int. Cl. B65h *54/22, 63/00, 49/12*
U.S. Cl. 242—35.6 R **4 Claims**



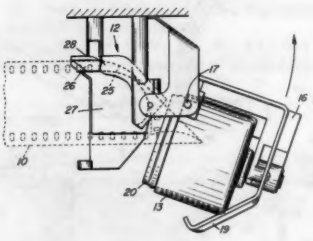
An apparatus for monitoring the operation of a textile winding machine upon which yarn is unwound successively from a plurality of yarn holders and wound onto a larger package. A signal-generating means is provided adjacent a yarn holder indexing mechanism for generating a signal each time a full yarn holder is rotated into the unwinding position. Another signal-generating means is carried by the winding machine for generating a signal responsive to manually restarting the machine, such as takes place after the larger package has been doffed or there has been a mistie.

3,603,519
PAPER DISPENSER
Jerry A. Brown, and Charles E. Schroer, both of Columbus, Ohio, assignors to Hamilton Cosco, INC., Columbus, Ind.
Filed Apr. 28, 1969, Ser. No. 819,716
Int. Cl. B65h *19/04;* **A47k** *10/22*
U.S. Cl. 242—55.3 **6 Claims**



A dispenser for holding and dispensing several rolls of paper products, such as wax paper, aluminum foil and paper towels, having a door hinged to the front thereof and provided with slots through which the paper is dispensed. A pair of vertically spaced trays are swingably connected to the sides of the container and are swingable between an operative position for supporting a pair of rolls and an outwardly angled position for loading fresh paper rolls thereon. A wire support having inwardly curved end portions for reception in a third roll of material is swingably connected through the lower portions of the door to the container.

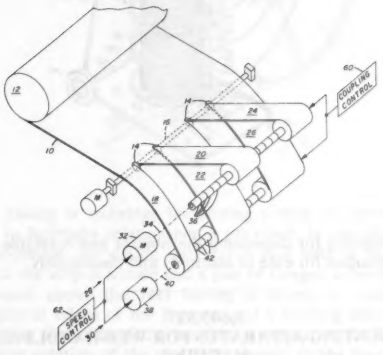
3,603,520
FILMSTRIP TAKEUP
Robert N. McFadden, Fairport, N.Y., assignor to Graflex, Inc.
Filed Feb. 1, 1968, Ser. No. 702,432
Int. Cl. B65h *17/48*
U.S. Cl. 242—55.21 **21 Claims**



An improved filmstrip guide includes an edge abutment surface and an outside guide surface for conforming a filmstrip to the surface of an imaginary cone from which the strip is steered into a coil in an open-ended cylindrical container. The edge abutment surface extends inward from the cone surface and follows a helix on the cone that is a straight line in a development of the cone. The outside guide surface lies on the cone surface next to the edge abutment surface, and

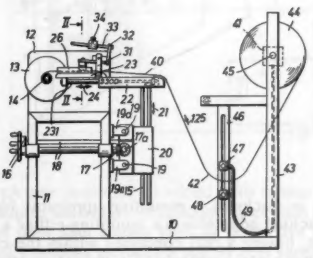
both guide surfaces extend about 180° around the cone and terminate near the open end of the container. The cone's rays generally pass through the space inside the coil, and the cone diameter in the plane of the open end of the coil is less than the inside diameter of the coil.

3,603,521
WEB WINDING APPARATUS
Thomas R. Ormsby, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed June 2, 1969, Ser. No. 829,485
Int. Cl. B65h *35/02*
U.S. Cl. 242—56.2 **11 Claims**



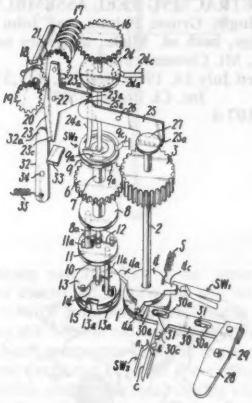
A web-winding system is disclosed as employing clutches so ganged on a common drive that wide webs may be wound simultaneously with, and to the same tightness as, narrower webs. The coupling of each such clutch is controlled by a computer which operates by maintaining constant the total end face area of the supply and rewind rolls. The drive speed is also computer-controlled to minimize the heat-producing slippage within such clutches.

3,603,522
TAPE WINDING APPARATUS
Helmut Herrmann, Cologne, Braunsfeld, Germany, assignor to Metalloxyd GmbH, Cologne Braunsfeld, Germany
Filed July 15, 1969, Ser. No. 841,771
Claims priority, application Germany, Aug. 17, 1968, P 17 74 704.5
Int. Cl. B65h *19/20*
U.S. Cl. 242—56 R **28 Claims**



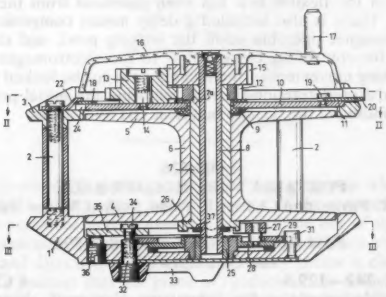
A tape winding apparatus comprises a tape supply and a tape-winding mandrel receiving tape from the supply and winding the tape in form of a coil. A tape guide channel is arranged upstream of the mandrel and is elongated in the direction of approach of the tape. The tape guide channel confines the tape against movement in lateral direction to assure that the radial faces of a coil wound from the tape will be entirely planar. A friction pad or the like engages one major surface of the advancing tape within the confines of the channel. An arrangement is also disclosed for utilizing this apparatus for automated operation.

3,603,523
COUNTER MECHANISM IN MOTOR-DRIVEN CAMERA
Kaoru Umeda, Sakai, Osaka Prefecture, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Aug. 19, 1969, Ser. No. 851,388
Claims priority, application Japan, Sept. 27, 1968, 43/84884
Int. Cl. B65h *25/04;* **G03b** *1/04*
U.S. Cl. 242—57 **9 Claims**



A switch disposed in a power supply circuit of a motor is opened by a counter which is driven relatedly with film transport when a preselected number of film frames have been wound up so as to halt winding operation. The switch is closed again upon effecting rewinding operation while at the same time the circuit is changed from the winding circuit to a rewinding circuit by a changeover switch. When the film has been rewound slightly beyond the windup initiating position while the counter is driven in the reverse direction, another switch is opened to stop the rewinding operation. The counter shaft is returned to the windup initiating position when the camera back cover is opened.

3,603,524
FISHING REELS, ESPECIALLY FLY-FISHING REELS
Karl Nurmse, and Hugo Ragnvald Svensson, both of Svangsta, Sweden, assignors to ABU Aktiebolag, Svangsta, Sweden
Filed June 23, 1969, Ser. No. 835,624
Claims priority, application Sweden, June 25, 1968, 8599
Int. Cl. A01k *89/02*
U.S. Cl. 242—84.1 **4 Claims**



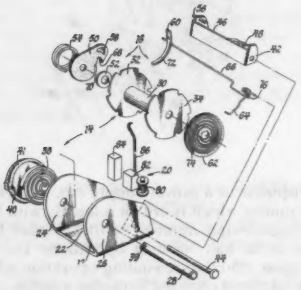
There is provided an arrangement in fishing reels by which the different components can be dismantled and exposed by

simple manual manipulation, the arrangement being such that the primary reel shaft or spindle connected with the crank and an input gear of the transmission system is detachably mounted in bearings disposed in a side member of the reel while a secondary shaft, which carries an output gear of said transmission and the reel spool and telescoping the primary shaft, is arranged for rotation on the primary shaft and mounted between the reel spool and the crank in a detachable end plate. Suitable locking means are provided which, when moved by simple hand movements to register with component release means, permit the various components to be withdrawn from the reel framework.

3,603,525
RETRACTING REEL ASSEMBLY

William L. Pringle, Grosse Pointe, and John S. Cucheran, Pleasant Ridge, both of, Mich., assignors to Jim Robbins Seat Belt Co., Mt. Clemens, Mich.

Filed July 14, 1969, Ser. No. 841,310
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.4 **9 Claims**



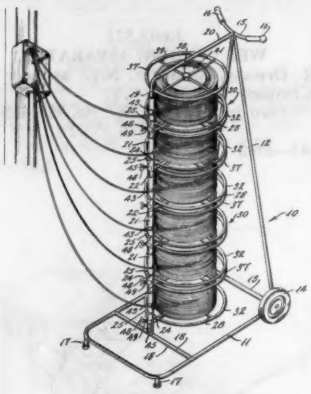
A retracting reel assembly including a U-shaped support member rotatably supporting a reel means upon which a flexible belt element is wound and unwound. A locking pawl is supported by the support member for movement to and from a locking position for preventing rotation of the reel means in the unwinding direction. A clutch member engages the locking pawl and is rotated by the reel means for moving the locking pawl to the locking position. A cam operated stop member is movable to and from a position for preventing movement of the clutch member which would move the locking member to the locked position until a predetermined length of the flexible belt has been unwound from the reel means. There is also included a delay means comprising an electromagnet operable upon the locking pawl, and circuit means for controlling current flow to the electromagnet for preventing movement of the locking pawl to the locked position for a predetermined period following the initial portion of unwinding of the flexible belt from the reel means.

3,603,526
PORTABLE WIRE HOLDER RACK

Jesse W. Payne, and Charles E. Rudd, both of Manns Harbor, N.C.

Filed Oct. 15, 1969, Ser. No. 866,595
Int. Cl. B65h *49/00*
U.S. Cl. 242—129.8 **6 Claims**

Portable apparatus for supporting elongated objects of various sizes in such a manner that the objects can be easily applied to the apparatus and arranged so that an undetermined amount of one or more desired sizes can be easily removed without kinking or snarling. The apparatus includes a support post having a plurality of adjustable reels mounted

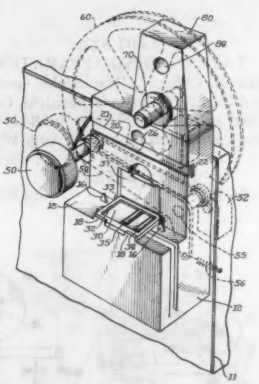


in one position for dispensing the objects and rotatable to a second position for ease of assembly and disassembly.

3,603,527
MOUNTING APPARATUS FOR WEB-HANDLING MACHINE

Edward R. Prelletz, Chicago, and Roland R. Rucinski, Villa Park, both of, Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Apr. 21, 1969, Ser. No. 817,914
Int. Cl. G03b *1/04*; **G11b** *15/32*
U.S. Cl. 242—195 **32 Claims**

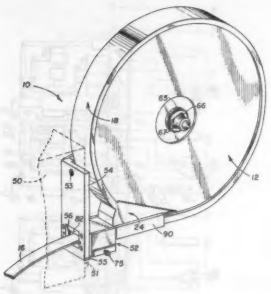


There is disclosed a mounting apparatus for a web-handling machine adaptable for mounting either a web-carrying cartridge, having a reel contained within the cartridge, or a web-carrying reel, comprising a mounting structure having alignment means on the structure to locate the cartridge or reel in an operative position, means to lock the cartridge or reel in an operative position, aperture means within the mounting structure to enable the web to be fed into the web-handling machine and external rewinding means connected to the mounting structure and operable into an operative position for driving the conventional reel or the reel within the cartridge in a reverse direction.

3,603,528
CASING FOR STORING A STRIP OF PHOTOGRAPHIC FILM

Charles R. Kingsley; John C. Kohler; Robert P. Lehmann, and Lawrence A. Ulmschneider, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 10, 1969, Ser. No. 805,519
Int. Cl. G11b *23/10*; G03b *23/04*
U.S. Cl. 242—197 11 Claims

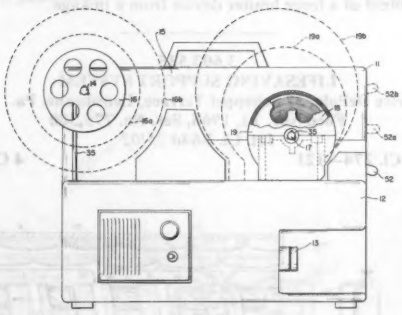


A casing or cartridge for storing a strip of photographic film in lighttight relationship is provided. In one illustrative embodiment the casing includes a reel with a hub about which the strip is wound and a pair of flanges, a flexible band disposed about the reel having a recess to receive the peripheral edges of the flanges, and a locking assembly for coupling the ends of the band in a manner to facilitate the relative rotation of the reel with respect to the band and to provide a lighttight passageway through which the strip may be drawn freely.

3,603,529
ADJUSTABLE SPINDLE ARM FOR CARTRIDGE-LOADING MOTION PICTURE PROJECTOR

John J. Bundschuh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 20, 1968, Ser. No. 777,286
Int. Cl. G03b *1/04*; G11b *15/32, 23/04*
U.S. Cl. 242—197 3 Claims

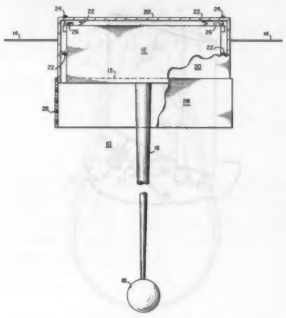


A motion picture projector provided with means for supporting film supply cartridges of different sizes with the rotational axes of their film supply reels at respective different predetermined positions includes a supply reel support spindle carried by an arm which is angularly adjustable about an axis parallel to the spindle to selectively position the spindle at different ones of such predetermined positions of the reel axis. Preferably, the spindle may be positioned at locations which do not necessarily lie on an arc of a circle thereby allowing for interchangeable cartridges containing reels whose axes do not define the arc of a circle in their respective positions on the projector.

3,603,530
PASSIVE TEMPERATURE CONTROL FOR SATELLITE

Roger L. Easton; Charles A. Bartholomew, and Robert S. Rovinski, all of Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 3, 1969, Ser. No. 863,457
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 SC 9 Claims

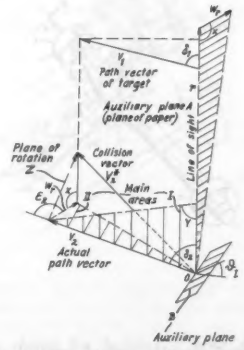


An earth-facing satellite having an inner compartment which contains electronic equipment and an outer housing which is heat isolated from and surrounds the inner compartment except on the bottom side of the satellite. Passive control of the ambient temperature of the inner compartment is obtained by heat exchange between the earth and the bottom side of the satellite and by thermal shields which protect the bottom surface from direct solar radiation.

3,603,531
METHOD AND APPARATUS FOR SPATIAL PROPORTIONAL NAVIGATION

Kurt Brucker-Steinkuhl, Fullenbachstrasse, Dusseldorf-Nord, Germany

Filed Dec. 4, 1968, Ser. No. 781,091
Claims priority, application Germany, Dec. 8, 1967, P 15 31 497.3
Int. Cl. F41g *9/00, 7/00, 7/18*
U.S. Cl. 244—3.16 9 Claims



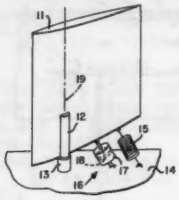
A method of spatial proportional navigation in which the angular velocity of the velocity vector of the steerable body is proportional to the angular velocity of the line of sight and an apparatus for carrying out the method wherein the position and direction of the angular velocity vector is chosen in such a manner that the plane of rotation of the velocity vector of the steerable body or of the steerable body itself contains the velocity vector V_2* of the collision or constant bearing course, and that the actual course is pursued with the least possible positioning in the collision course.

3,603,532

APPARATUS FOR AUTOMATICALLY STABILIZING THE ATTITUDE OF A NONGUIDED VEHICLE

Volker W. Harms, Mountain View, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Apr. 28, 1969, Ser. No. 819,898
Int. Cl. F42b *15/16*
U.S. Cl. 244—3.21 3 Claims



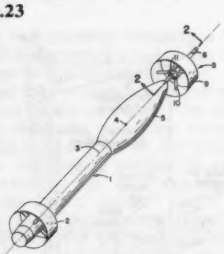
The attitude of a nonguided missile, or vehicle, is stabilized with its trajectory by a freely rotatable control surface on the vehicle that is prevented from aligning completely with the incident airstream due to a biasing spring. This results in any vehicle attitude deviation providing a moment to the vehicle that rotates it toward its desired attitude in line with the trajectory. Rapid damping of the vehicle attitude to be in line with its trajectory is accomplished by the control surface rotational movement back to its stable position lagging the rotational movement of the vehicle back to its desired attitude.

3,603,533

SPIN STABILIZED RING-WING CANARD CONTROLLED MISSILE

William W. Stripling, Huntsville, Ala. assignor to the United States as represented by the Secretary of the Army

Filed Sept. 29, 1969, Ser. No. 861,690
Int. Cl. F42b *13/00*
U.S. Cl. 244—3.23 2 Claims



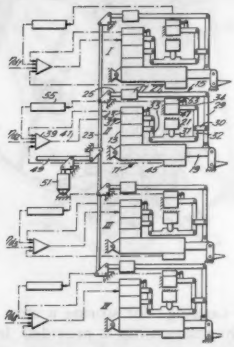
A spin stabilized circular canard control surface for attitude control of missiles. The canard control surface guides a missile along a path determined by the attitude of a space oriented spinning canard. The canard is spun free around a spherical bearing located on a boom projecting forward of the missile nose and is disposed with its spin axis pivoted about a point in the longitudinal axis of the missile. When a disturbing force causes rotation of the missile axis from the canard axis, the canard applies to the missile a restoring torque to thereby restore coincidence of the missile and canard axes.

3,603,534

SYNCHRONIZED POWER CONTROL

Richard Kenneth Barltrop, Rochester, Kent, England, assignor to Elliott Brothers (London) Limited, London, England

Filed Aug. 6, 1969, Ser. No. 848,031
Claims priority, application England, Aug. 10, 1968, Nov. 18, 1968, 38338/68;54583/68
Int. Cl. B64c *13/36*
U.S. Cl. 244—78 6 Claims



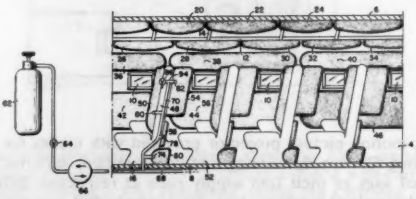
The invention is concerned with overcoming spurious operation of force limiter devices included in linkages associated with individual actuator lanes respectively controlling the portions of a split control surface of an aircraft in response to electrical signals supplied to the actuator lanes and to manual movement of a control run of the aircraft. Such spurious operation of the force limiters arises as a result of manufacturing tolerances in the circuitry supplying the electrical signals. The problem is solved by providing in the linkages breakout springs connected to respective ones of the linkages and each of which has a force threshold which is less than that of the force limiter devices and chosen so that disparities in commanded ram positions due to differences in the command signals due to tolerance buildup, may be accommodated by the breakout springs without causing disengagement of a force limiter device from a linkage.

3,603,535

LIFESAVING SUPPORT SYSTEM

Maurice DePolo, 37 Schappet Terrace, Lansdowne, Pa.

Filed Nov. 13, 1968, Ser. No. 775,300
Int. Cl. B64d *25/02*
U.S. Cl. 274—121 4 Claims



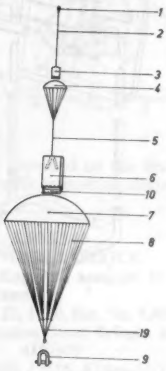
A lifesaving support system comprising inflatible panels positioned on the seats, bulkheads and baggage racks of an airplane or the like. A gas system is provided for inflating the panels with carbon dioxide during takeoff and landing, the inflated panels cushion the shock and thereby protect the passengers in case of a crash or a violent landing.

3,603,536

CARGO PARACHUTE ASSEMBLY

Heinz Dochow, Sachsenried Uber Schongau, Germany, assignor to Richard Kohnke Fallschirmwerk, Ziegelhausen near Heidelberg, Germany

Filed Jan. 16, 1969, Ser. No. 791,668
Int. Cl. B64d 17/40
U.S. Cl. 244—142 2 Claims



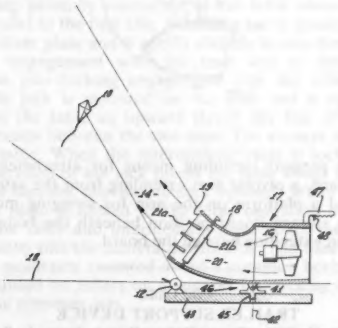
The pilot parachute and the cargo parachute, together with all of their fittings, are assembled and packaged as one single complete unit.

3,603,537

INDUCED AIR DISPLACEMENT CONTROL OF FLYING OBJECTS

Richard J. Burke, 3428 Ocean Boulevard, Corona del Mar, and Peter B. S. Lissaman, 1201 E. California Street, Pasadena, both of, Calif.

Filed Sept. 2, 1969, Ser. No. 854,711
Int. Cl. B64c 31/06; A63h 27/08
U.S. Cl. 244—155 8 Claims



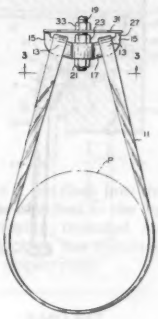
The invention concerns the provision of an apparatus that includes a light weight tethered object, such as a miniature kite, and a blower having a flow director located for directing blower displaced air toward the object to maintain the object in an elevated position.

3,603,538

ADJUSTABLE CORROSION RESISTANT PIPE HANGER

John K. Vitas, 765 S.E. Ridgeview Terrace, Beaverton, Oreg.

Filed Oct. 27, 1969, Ser. No. 869,819
Int. Cl. F16l 3/14
U.S. Cl. 248—59 1 Claim



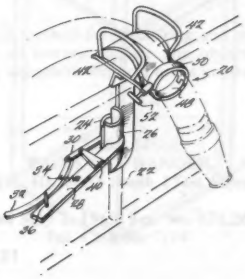
A pipe hanger having a corrosion resistant strap hung by two eye portions on the arms of a support member, and retained in place by a safety bar. The support member and safety bar are adjustable along a hanger rod to properly locate the strap and the pipe it supports.

3,603,539

SOFT HOSE CLAMP

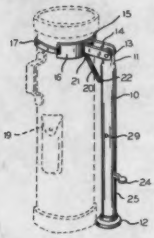
Kenneth K. Clegg, Jr., Route 1, Box 80, High Point, N.C.

Filed Jan. 13, 1970, Ser. No. 2,633
Int. Cl. B05b 15/06; A62c 27/06
U.S. Cl. 248—79 3 Claims



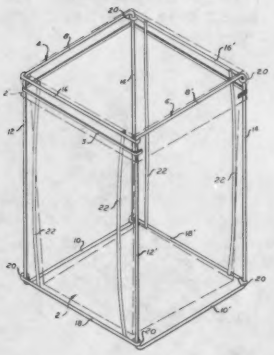
A soft hose clamp for holding a hose discharging fire fighting liquid from a tanker truck into a collapsible stop-and-go tank. In the embodiment of the invention described below, the device is provided with a first adjustable clamping member for affixing the hose clamp to any vertical brace or strut supporting the tank and a second hinged, spring-loaded clamping member for receiving the supply line and holding it securely while the fire fighting liquid is discharged into the tank. The hose can be mounted in place quickly and with one hand and the novel clamp described herein holds the hose firmly in place while water is being transferred from a tanker to a stop-and-go or other similar tank.

3,603,540
GOLF BAG SUPPORT
Edwin Gouge, 1007 Milwaukee Avenue, and James E. McDonald, 1613 Manitowa Avenue, both of South Milwaukee, Wis.
Filed July 24, 1969, Ser. No. 844,276
Int. Cl. A63b *55/04, 55/10*
U.S. Cl. 248—96 **5 Claims**



Golf bag support that will retain and support bag in vertical position. A resilient member extends between the bag attaching member and the upright portion of the support.

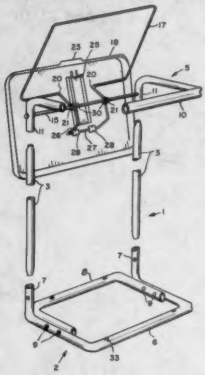
3,603,541
COLLAPSIBLE BAG SUPPORT
Jacob H. Sturm, and Lucille I. Sturm, both of Route #1, Box 362, Lone Oak, Tex.
Filed Feb. 19, 1969, Ser. No. 800,396
Int. Cl. B65b *67/12*
U.S. Cl. 248—97 **12 Claims**



A collapsible bag support having hinged connections between adjoining sides and resilient bars extending between the upper and lower ends of two of the sides to secure the hinged connections at any desired angle.

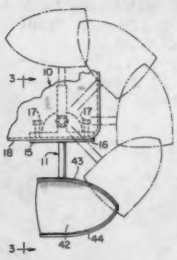
3,603,542
REFUSE BAG HOLDING RACK
Michael Grille, 33 Florgate Road, Farmingdale, N.Y.
Filed Apr. 1, 1969, Ser. No. 811,899
Int. Cl. B65d *67/02*
U.S. Cl. 248—98 **12 Claims**

A holding rack for disposable flexible plastic bags adapted for casters, wheels or wall mounting and featuring a pivotable bag-holding loop with low durometer coating cooperating with an annular bag-support member for strongly supporting the bag with its end open from the support, and a closing lid for the bag opening having a novel double-hinging bracket al-



lowing positioning of the lid to one side away from the bag opening providing ready access thereto.

3,603,543
IRON SUPPORT FOR ATTACHMENT TO AN IRONING BOARD
Helen P. Bottos, 361 Marlton Avenue, Camden, N.J.
Filed May 14, 1969, Ser. No. 824,525
Int. Cl. D06f *79/02*
U.S. Cl. 248—117.6 **6 Claims**

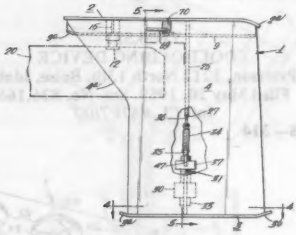


An iron support including means for attachment to an ironing board, a pivotal arm extending from the attachment means, and a platform on the arm for swinging movement between a storage board position beneath the board and a use position extending beyond the board.

3,603,544
TRAILER SUPPORT DEVICE
Richard W. Griffith, Green Ridge, Pa., assignor to Sun Shipbuilding & Dry Dock Company, Chester, Pa.
Filed June 26, 1967, Ser. No. 648,920
Int. Cl. B60p *7/00*
U.S. Cl. 248—119 S **2 Claims**

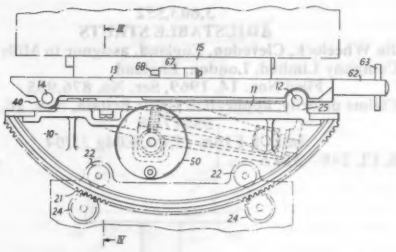
A rigid boxlike structure provides a stand or support for trailers during transport thereof on ships or railway cars. The support has a kingpin which can engage the "fifth wheel" of a tractor, and also has a "fifth wheel" which can engage the kingpin of a trailer. The support can thus be used to couple a tractor to a trailer and, when released from the tractor, can

support the front end of the trailer on a ship's deck. The support carries a latching member which is engageable with a



fixed latching abutment provided on the deck to secure the support and hence the trailer in position during the voyage.

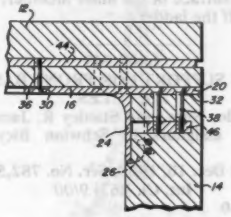
3,603,545
TILT-TABLE DEVICE
Roy Boniface, London, England, assignor to Ernest F. Moy Limited, London, England
Filed Jan. 22, 1970, Ser. No. 5,053
Claims priority, application Great Britain, Jan. 24, 1969, 4157/69
Int. Cl. G03b *17/56*; F16m *11/12*
U.S. Cl. 248—184 **11 Claims**



A device for adjusting the angle of tilt of a camera has a table connected to a base below the table by an intermediate plate, one end of the intermediate plate being pivotally connected to the base about a horizontal first axis and the other end being pivotally connected to the table about a second axis parallel to the first axis. A locking bar is mounting on the intermediate plate and is axially slidable in one direction into locking engagement with the base and in the opposite direction into locking engagement with the table. An expandable jack is mounted on the base and is operable to exert on the table an upward thrust, the line of action of which passes between the two axes. The camera is mounted on the table. When the intermediate plate is locked to the base operation of the jack pivots the table about the second axis and thereby tilts the camera upward. When the intermediate plate is locked to the table operation of the jack pivots the table and intermediate plate about the first axis and thereby tilts the camera downwards. The base may have arcuate quadrants centered about a common horizontal axis and mounted on rollers on a support for rocking movement about the common axis.

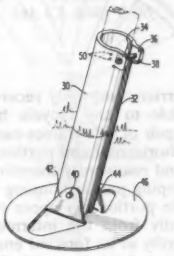
3,603,546
FURNITURE LEG ATTACHMENT ASSEMBLY
Klaus P. Ruffert, High Point, N.C., assignor to Myrtle Desk Company
Filed Jan. 29, 1969, Ser. No. 794,942
Int. Cl. F16m *11/16*
U.S. Cl. 248—188 **4 Claims**

A leg attachment assembly connecting a furniture leg to an article of furniture for providing maximum rigidity and strength to the leg and eliminating wobbling of the assembled furniture. A bracket plate overlies and is secured to the top end of the leg and underlies and is secured to the undersurface of the article of furniture. A depending support bracket is disposed in a recess in the inner corner of the leg and is



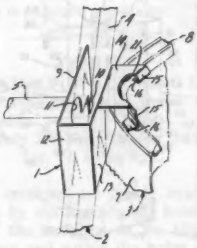
secured thereto so that it fits flush into the leg thereby bracing the leg. The plate is attached to the leg and to the article of furniture by employing threaded steel bars that are threaded into a steel locking bar mounted in the leg and in the article of furniture respectively.

3,603,547
STABILIZING AND LEVELING DEVICE
James F. Hills, Atlanta, Ga., assignor to Applied Technical Services, Inc., Smyrna, Ga.
Filed Nov. 27, 1968, Ser. No. 779,458
Int. Cl. F16m *7/00*
U.S. Cl. 248—188.2 **1 Claim**



Apparatus and method for stabilizing and maintaining in a level plane on an uneven surface any object supported by legs comprising adjustable support tubes pivotally attached to a base plate.

3,603,548
PAINT CAN HANGER
William A. Meyer, III, 1633 South 171st Street, New Berlin, Wis.
Filed May 2, 1969, Ser. No. 821,262
Int. Cl. E06c *7/14*
U.S. Cl. 248—211 **3 Claims**



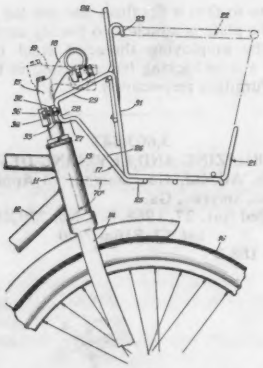
A paint can hanger has a pair of parallel inner and outer members forming a channel which fits over a ladder side rail

and with cutout portions receivable over a round rung or flat step. A web, spaced from the ladder side rail, joins the parallel members. A flange extends inwardly from the inner member and has two channellike fingers which fit over and embrace the can lip. A paint can is secured between the fingers and the side surface of the inner member, both when the hanger is on or off the ladder.

3,603,549
UNIVERSAL SUPPORT FOR FRONT BASKET FOR BICYCLES

Frank P. Brilando, Niles, and Stanley R. Jameson, Chicago, both of, Ill., assignors to Schwinn Bicycle Company, Chicago, Ill.

Filed Dec. 10, 1968, Ser. No. 782,589
Int. Cl. B62j *9/00*
U.S. Cl. 248—230 **3 Claims**

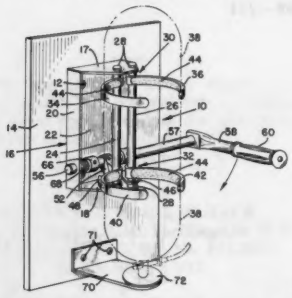


Support for a carrier removably receiving a front basket universally attachable to any bicycle having a handlebar stem, comprising a pair of side frames each bent from a tube to provide a lower horizontal end portion, a lower reach extending upwardly and rearwardly therefrom and terminating in a downwardly sloping part continuing as an upwardly extending intermediate portion, an upper reach extending upwardly and forwardly from the intermediate portion, and continuing downwardly at its forward end for attachment to the lower horizontal end portion, with the upper and lower reaches converging respectively from the front to the intermediate portions which are spaced from and parallel to each other, and clamping means for engaging the handlebar stem.

3,603,550
QUICK RELEASE SUPPORT

Clarence D. Byrd, Colfax, N.C., assignor to Lacy J. Miller Machine Company, Inc., Welcome, N.C.

Filed Oct. 14, 1969, Ser. No. 866,295
Int. Cl. A62c *33/00*
U.S. Cl. 248—313 **10 Claims**

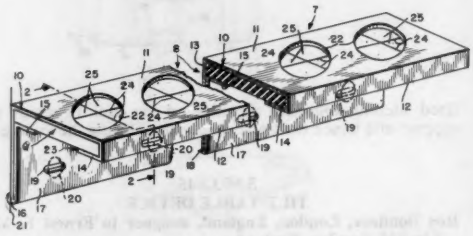


A quick release support for emergency equipment or the like wherein a dog member is biased into wedging engagement between pivotably mounted lugs secured to jaws which clamp an object therebetween. A release handle is actuated to disengage the dog from the lugs permitting the clamping jaws to open and release the object.

3,603,551
TOOLHOLDING DEVICE

Darwin H. Peterson, 1212 North 13th, Boise, Idaho

Filed May 20, 1969, Ser. No. 826,166
Int. Cl. A47f *7/00*
U.S. Cl. 248—314 **2 Claims**

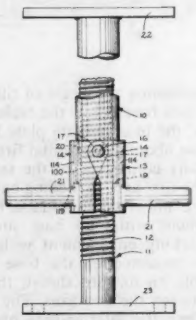


A device for yieldably gripping long slender shanks of tools or implements of different cross-sectional sizes and shapes for demountably supporting the tools or implements in a stored position and without the use of magnets.

3,603,552
ADJUSTABLE STRUTS

Colin Wheelock, Clevedon, England, assignor to Mills Scaffold Company Limited, London, England

Filed Nov. 14, 1969, Ser. No. 876,935
Claims priority, application Great Britain, Nov. 26, 1968, 55917/68
Int. Cl. F16m *13/00;* **E04g** *25/04*
U.S. Cl. 248—354 S **4 Claims**



This invention relates to an adjustable telescopic strut with the inner member having a screw thread engaging a rotatable adjusting nut, in which the adjusting nut is readily disengageable from the screw thread to effect rapid adjustment of the strut.

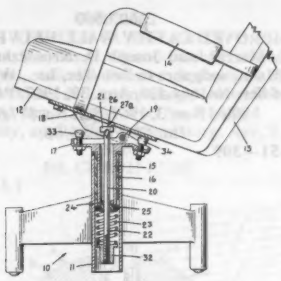
3,603,553
CHAIR CONTROL

Frank Doerner, Waterloo, Ontario, Canada, assignor to Doerner Products Co. Limited, Ontario, Canada

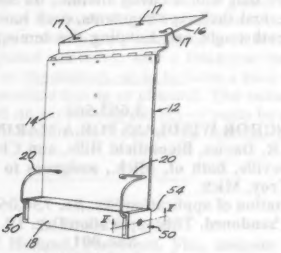
Filed Oct. 17, 1969, Ser. No. 867,136
Int. Cl. A47c *3/026*
U.S. Cl. 248—381 **1 Claim**

A chair control for a tilting chair having a simplified construction. The chair control has a control tube which is telescopically mounted in the tubular chair post of the chair. The control tube has a fixed control frame mounted on the top thereof and a tiltable frame pivotally mounted on the control

frame. The tiltable frame is attachable to the underside of the chair seat. Spring biasing means is mounted within the control tube and operatively connected to the tiltable frame to yieldably resist pivotal movement of the tiltable frame under a backward tilt force applied by the occupant of the chair.



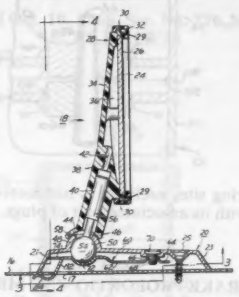
3,603,554
BOOKHOLDER
Henry R. Dickinson, III, 222 Parkhurst, Spring Lake, Mich.
Filed Oct. 3, 1969, Ser. No. 863,549
Int. Cl. A47b *97/04*; F16f *1/04*
U.S. Cl. 248—453 **6 Claims**



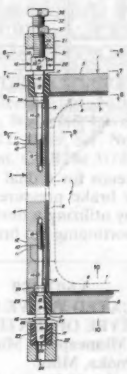
An improved bookholder utilizing a novel spring clamp biased against the support surface of the holder, the clamp including a spring separate from the holddown arm so as to utilize a different gauge wire. In one embodiment the spring contains a coiled extension of the arm, tension being developed in the spring by means of a straight extension of the arm pressing against an axially extending arm of the coil spring. In the other embodiment, a core is contained by the spring and has at one end a camming surface for engagement by an extension of the holddown arm, the extension in this case not curving to form a coil but only a portion of a complete circle. In both embodiments, an end cap is centered within the housing containing the spring mechanisms, the cap including a clamping lip to assist in attaching the housing to the support surface of the bookholder.

3,603,555
OUTSIDE REARVIEW MIRROR ASSEMBLY
Thomas E. Lohr, Warren, Mich., assignor to Allied Chemical Corporation, New York, N.Y.
Filed Mar. 21, 1969, Ser. No. 809,122
Int. Cl. B60r *1/00*
U.S. Cl. 248—481 **8 Claims**

A rearview mirror assembly for attachment to the outside of a vehicle, such as a motor car, at a convenient location for the driver to see and reach for manual adjustment, which is provided with a ball and socket swivel joint secured by a pretensioned adjustable spring retainer. The mirror is supported on a stem which extends into a mirror support column having a ball on the other end for swivel support within a ball socket formed in the base support bracket and the ball is retained in the ball socket by an adjustable pretensioned leaf spring, the construction being such that all members can be preassembled together in a convenient manner. The supporting portions of the mirror are made of plastic material of such strength, at least at the swivel joint, as to break or snap off under impact to provide a safety feature.



3,603,556
PIVOTED MEMBER ASSEMBLY
Virgil L. Frantz, Salem, Va., assignor to Graham-White Sales Corporation, Salem, Va.
Continuation of application Ser. No. 43,036, July 15, 1960, now abandoned. This application Oct. 22, 1965, Ser. No. 516,184
Int. Cl. B60r *1/06*
U.S. Cl. 248—479 **5 Claims**

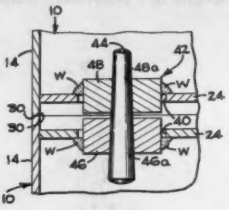


This invention relates to pivoted member assemblies and has as its primary object the provision of an improved pivoted member assembly in which the pivoted member can be held by friction in a selected position despite vibrations to which its mounting is exposed in service.

3,603,557
APPARATUS FOR ALIGNING FORMS
Willard M. Lind, Lakeland, Fla., assignor to FMC Corporation, San Jose, Calif.
Filed July 2, 1968, Ser. No. 742,095
Int. Cl. E04g *9/00*
U.S. Cl. 249—192 **1 Claim**

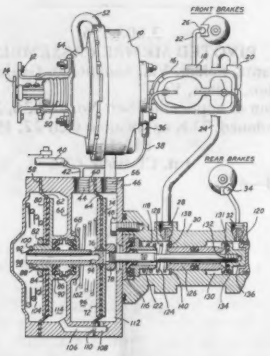
Concrete form sections are made ready for easy subsequent alignment by cutting aligned holes in the opposed end bulkheads of the sections to be aligned and placing between the sections and within the holes alignment devices each of which consist of a set of two apertured plugs which are received upon and snugly engaged with a tapered pin. Each plug of a set is welded to one of the opposing bulkheads

and the pin is then removed to permit the form sections to be separated. When the sections are subsequently aligned at the



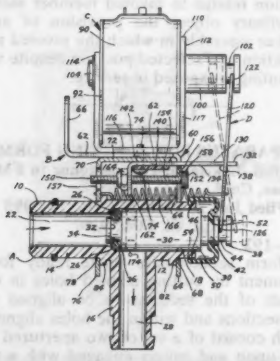
concrete pouring site, each pin is hammered back into snug engagement with its associated pair of plugs.

3,603,558
BRAKE PROPORTIONING MEANS
Maxwell L. Cripe, South Bend, Ind., assignor to The Bendix Corporation
Division of Ser. No. 773,074, Nov. 4, 1968, Pat. No. 3,517,970.
Filed Jan. 9, 1970, Ser. No. 1,657
Int. Cl. F16k *31/145*
U.S. Cl. 251—61.5 **5 Claims**



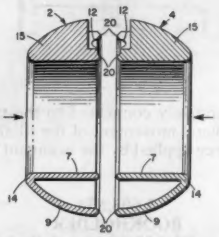
A proportioning means for a dual hydraulic brake system that will regulate the brake pressure in one portion of that system in two steps by utilizing a device responsive to a control pressure for proportioning the brake pressure in steps.

3,603,559
SOLENOID-ACTUATED VALVE MECHANISM WITH LEVER-TYPE OPERATING MEANS
Gilbert V. P. Totten, Minneapolis, Minn., assignor to The Cornelius Company, Onoka, Minn.
Filed Feb. 14, 1969, Ser. No. 799,187
Int. Cl. F16k *31/10*
U.S. Cl. 251—138 **9 Claims**



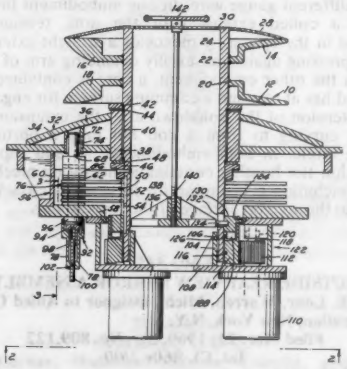
A plunger-type valve mechanism in which a lever operating the valve plunger is actuated by a solenoid and in which the fulcrum of the lever is adjustable to vary the maximum opening of the valve.

3,603,560
IMPROVED CAVITY WALL VALVE BALLS
Samuel E. Merrill, and Joseph D. Krosoczka, both of Worcester, Mass., assignors to Sem-Tec, Inc., Worcester, Mass.
Division of Ser. No. 664,426, Aug. 30, 1967, Pat. No. 3,518,742.
Filed Nov. 3, 1969, Ser. No. 877,549
Int. Cl. F16k *5/06*
U.S. Cl. 251—309 **18 Claims**



A valve ball with a cavity therein, formed by casting two semispherical shell-type segments, each having a tubular section therethrough, and bonding the semispherical segments together.

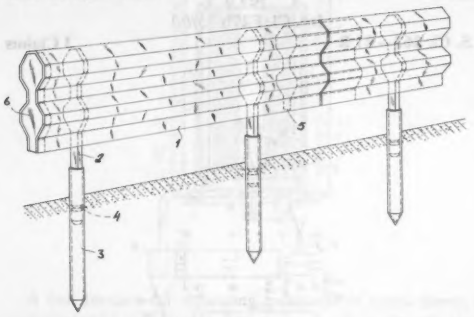
3,603,561
ANCHOR WINDLASS FOR A MARINE VESSEL
Edward R. Davies, Bloomfield Hills, and Charles E. Gregory, Anchorville, both of, Mich., assignors to Jered Industries, Inc., Troy, Mich.
Continuation of application Ser. No. 734,069, June 3, 1968, now abandoned. This application Dec. 19, 1969, Ser. No. 886,801
Int. Cl. B66d *1/30*
U.S. Cl. 254—150 R **8 Claims**



A powered windlass mechanism comprising an anchor chain winding drum or wildcat, a main support shaft carrying at its upper end the winding drum, driving motors geared to the main support shaft at its lower end, disc brake means for anchoring the main shaft and coupling means for connecting and disconnecting the main shaft and the drive gearing, all of

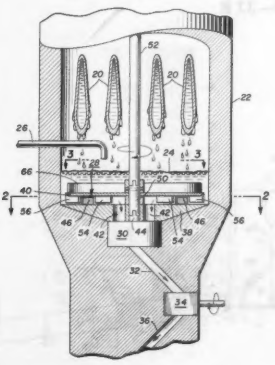
the elements of the windlass mechanism being located in a common housing secured to the deck of a marine vessel.

3,603,562
VEHICLE GUARD RAILS
Ernest Glaesener, Dudelange, Grand-Duchy, Luxembourg, assignor to Arbed, Acieries Reunies de Burbach-Eich-Dudelange, (Grand-Duchy de Luxembourg), Luxembourg
Filed Apr. 7, 1969, Ser. No. 814,054
Claims priority, application Luxembourg, Apr. 9, 1968, 55865
Int. Cl. E01f *15/00*
U.S. Cl. 256—13.1 **7 Claims**



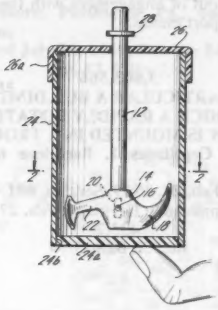
Vehicle guard-rail or barrier arrangement for the shoulders and median strips of roads. These vehicle guard rails, the length of which may be more than 20 meters, are constituted by a sheet-metal member (or a plurality of such members arranged in superposed manner), with a thickness less than 3 mm. and folded on themselves, so as to form a kind of closed or open hollow-profiled casing or channel. The vehicle guard rails are mounted on supporting sleeves or posts by means of fixing keys which match the form of the internal hollow of the rail.

3,603,563
BLENDER-PUMP
William Edward Holland, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.
Filed Dec. 12, 1968, Ser. No. 783,182
Int. Cl. B01f *7/20*; **B29b** *1/06*
U.S. Cl. 259—7 **3 Claims**



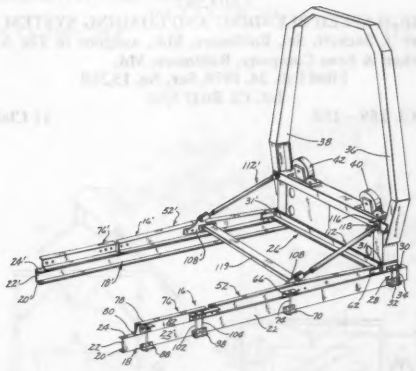
Interleaving vanes on relatively rotating opposed discs blend viscous fluids. The vanes are also inclined to pump the fluid centripetally to a discharge orifice near the axis of rotation.

3,603,564
MIXER
Howard Price, Kings Point, and Bela Szilagyi, Flushing, both of, N.Y., assignors to International Patents & Development Corp.
Filed Oct. 10, 1968, Ser. No. 776,301
Int. Cl. B01f *7/20*
U.S. Cl. 259—107 **13 Claims**



A disposable mixer adapted particularly for dental work. A rotary member has at its end a set of vanes, each having a unique shape for thoroughly intermixing constituents of a mixture within a disposable container. The outermost surface of each of the vanes fits snugly against the internal walls of the container. A shaft secured to the vanes may be driven by motor device for providing the mixing motion. The end of the container may be used to force the mixture from the container after completion of the mixing process.

3,603,565
SUPPORT FRAME FOR A CONCRETE MIXER TRUCK
James E. Johnson, Waterloo, Iowa, assignor to Construction Machinery Company, Waterloo, Iowa
Filed July 22, 1969, Ser. No. 843,549
Int. Cl. B28c *5/18*
U.S. Cl. 259—176 **8 Claims**



A support frame for a concrete mixer truck comprising a first and second frame assemblies which are detachably secured to the truck frame members. Each of the frame assemblies includes a frame member which is pivotally secured at its rearward end to the rear drum support means. The first frame member is spaced above the truck frame and is secured thereto intermediate the length thereof. A length adjustable rod or turnbuckle means is pivotally connected at its

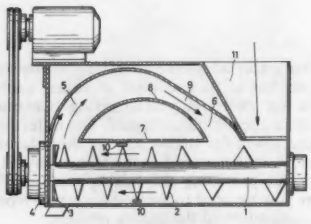
forward end to the first frame member and is pivotally connected at its rearward end to the drum support means. The forward end of the first frame member is secured to a second frame member which is positioned forwardly thereof and which is secured to the truck frame member. Each of the frame assemblies provides a multiple point suspension system for the concrete mixer drum support means so that the drum support means will be maintained in its proper position with respect to the frame means and mixer drum when the truck is passed over rough terrain so as to prevent the mixer drum rail from moving out of engagement with the rear rollers on the rear drum support means.

3,603,566

A MIXER IN PARTICULAR A BUILDING MATERIAL MIXER IN WHICH A RAPIDLY ROTATING WORM SCREW IS MOUNTED IN A TROUGH

Paul August, C. Cepellades 1, Barcelone 6/Spanien, Barcelona, Spain

Filed Feb. 24, 1969, Ser. No. 801,451
Claims priority, application Germany, Feb. 27, 1968, P 16 32 433.7
Int. Cl. B28c *5/14*
U.S. Cl. 259—178 **3 Claims**



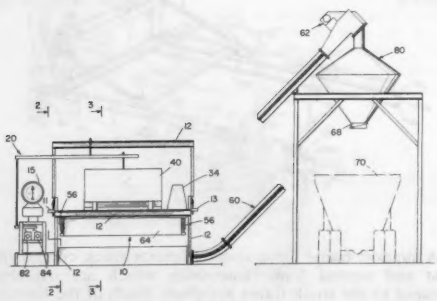
An improved building material mixer having a rapidly rotating worm screw mounted in a trough and a baffle plate disposed perpendicular to or at an angle to the worm screw is disclosed. A recirculation path for the building material is provided having a portion which is narrowed or constricted. Small friction plates may be fixed to the outer part of the worm screw.

3,603,567

HIGH SPEED BLENDING AND LOADING SYSTEM

Walter J. Sackett, Sr., Baltimore, Md., assignor to The A. J. Sackett & Sons Company, Baltimore, Md.

Filed Feb. 24, 1970, Ser. No. 13,310
Int. Cl. B01f *5/00*
U.S. Cl. 259—180 **11 Claims**



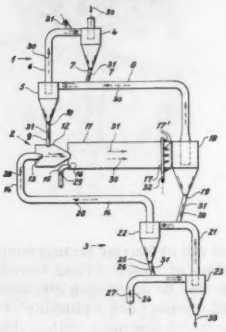
A high speed blending, weighing, and loading system is provided for handling and processing of materials having two or more ingredients. This system includes a primary weigh-blend hopper having a chute for receiving materials which, if necessary, are conditioned by breaking up of lumps of material in the chute and then passed on to the primary weigh-blend hopper for weighing and blending thereof.

3,603,568

APPARATUS FOR HEAT TREATMENT OF FINE MATERIAL

Horst Ritzmann, Neubeckum, Germany, assignor to Polysius AG, Neubeckum, Germany

Filed Oct. 8, 1969, Ser. No. 864,762
Claims priority, application Germany, Nov. 6, 1968, P 18 07 292.9
Int. Cl. F27b *15/00*
U.S. Cl. 263—21 R **3 Claims**



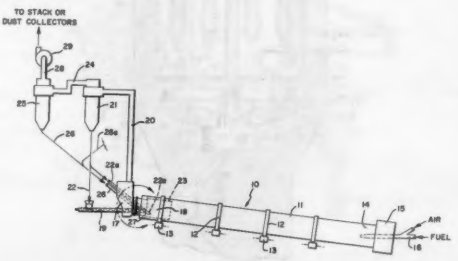
The apparatus comprises preheating, firing and cooling apparatus. Hot gases and fine material are passes concurrently through a firing chamber, and a separator is directly connected to the firing chamber.

3,603,569

KILN PREHEAT AND DRYING SECTION

Harry I. Abboud, and Oren C. Furnish, both of Baton Rouge, La., assignors to Kaiser Aluminum & Chemical, Oakland, Calif.

Filed Dec. 29, 1969, Ser. No. 888,378
Int. Cl. F27b *7/32*
U.S. Cl. 263—32 R **7 Claims**

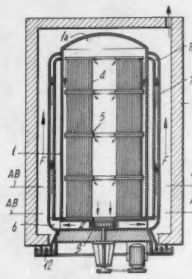


An improved kiln preheat and drying section comprising an inner shell concentric and axially aligned with the kiln shell, and provided with a means to feed raw material to be processed into the inner shell and means to feed dust into the annular space defined by the inner shell and kiln shell; and a process for operating the improved preheat and drying section.

3,603,570
BELL FURNACE FOR ANNEALING TREATMENT OF METAL SHEETS

Giulio Galeone, Milan, Italy, assignor to S.C.E.I. Soc. Costruz, Elettrotermiche Industriali S.p.A., Novara, Italy

Filed Mar. 26, 1969, Ser. No. 810,526
Claims priority, application Italy, Apr. 1, 1968, 14686
Int. Cl. F27b 11/00
U.S. Cl. 263—40 6 Claims

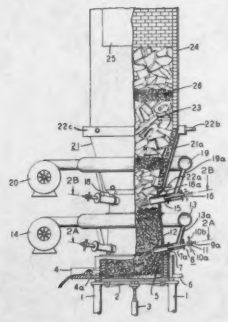


A bell furnace for annealing treatment of metal sheets in superimposed rolls has a first outer hood, a second inner hood for protection of the sheet rolls, a cylindrical annular space between the first outer hood and the second inner hood and an upper collecting chamber and a lower collecting chamber within the inner hood. There is disposed a plurality of vertical tubes circumferentially arranged about the sheet rolls externally of the second hood for the passage in ascending stage of the entire protective gas capacity from the lower collecting chamber to the upper collecting chamber; a diffuser is located within the lower collecting chamber and beneath the central bore of the sheet rolls for establishing a fluid circulation within the inner hood and the tubes arranged in the space between the inner and outer hoods.

3,603,571
APPARATUS FOR MELTING SCRAP METAL

Lewis J. Geiger, Jr., Edison, and James W. Estes, Piscataway, both of, N.J., assignors to Air Reduction Company, Incorporated, New York, N.Y.

Filed Aug. 11, 1967, Ser. No. 659,946
Int. Cl. C21b 7/16
U.S. Cl. 266—25 15 Claims

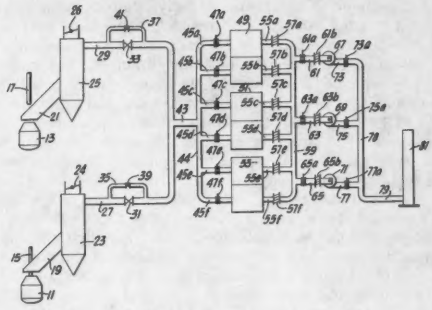


In a shaft furnace, method and apparatus for melting low density metallic scrap. Burners and/or tuyeres are located at two different levels in the body portion of the furnace. The charge is preheated by hot gases rising in the furnace stack, and melted at the upper burner level. As the molten metal trickles down over a support bed, which may either be coke, other types of carbon, or a refractory material, it is superheated to the desired spout temperature, and to provide a product of the desired analysis. A feature is the configuration of burners which imposes a swirling motion on gases entering the furnace.

3,603,572
METHOD AND APPARATUS FOR OPERATING BASIC OXYGEN FURNACES

Franz J. Rosentern, Pittsburgh, Pa., assignor to Koppers Company, Inc.

Filed July 28, 1969, Ser. No. 845,461
Int. Cl. C21c 5/40
U.S. Cl. 266—35 5 Claims

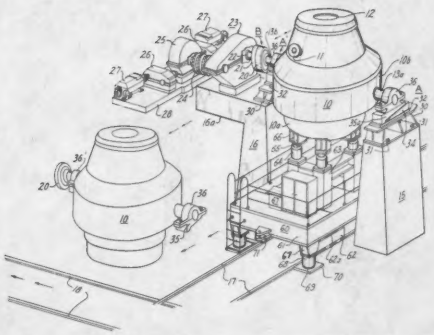


Disclosed is a method and apparatus for simultaneously blowing one basic oxygen furnace and burning in the lining of a second basic oxygen furnace; the waste gases from both operations being handled by a single gas-cleaning system and, by means of proper controls inherent to the method, so that virtually complete burning of all combustibles is assured.

3,603,573
FURNACE REMOVAL

John J. Gill, Beaver, Pa., assignor to Pennsylvania Engineering Corporation, New Castle, Pa.

Division of Ser. No. 664,095, Aug. 29, 1967, Pat. No. 3,504,421.
Filed Jan. 7, 1970, Ser. No. 1,179
Int. Cl. C21c 5/42
U.S. Cl. 266—36 P 11 Claims



A shaft-mounted rotatable furnace vessel or converter is provided with bearing housings journaling its shafts that are adapted to be raised and lowered on jack mounts or stands of a pair of spaced-apart stationary support piers. A driven trun-

nion shaft of the vessel or converter is provided with a conventional separable part type of coupling connecting it to a motor drive mechanism. Each jack mount or stand has a wedge-shaped or inclined slide part carried by a guide member for endwise guided movement, as effected by a reciprocating type of fluid motor operatively connected to one end of the slide part. Each bearing housing has a slide or wedge-shaped portion cooperating with an associated slide part and adapted to be raised and lowered by endwise movement of the slide part. An end retainer having a pair of spaced-apart portions projects upwardly from the jack mount adjacent an end thereof on which the motor is positioned and through which the motor is adapted to operatively extend in its connection to the slide part. This end retainer has an abutment portion to abut one end of an associated bearing housing; it cooperates with an opposite end retainer that is removably secured on the jack mount to abut an adjacent end of the associated bearing housing. The upwardly projecting end retainers positively or securely retain or mount an associated bearing housing with respect to the slide part. The end retainers also function to limit the maximum endwise movement of the slide part in either direction. The inclined or wedge-shaped slide portion of each bearing housing is complementary with the slide part to raise and lower the associated housing when the slide part is reciprocated by the fluid motor. The structure enables a converter vessel or furnace to be raised with respect to its piers or stands, in order that a transport car may be wheeled into position between the piers and stands and into a cooperating position under the vessel, that the support or weight of the vessel may be transferred from the stands to the car, and that the vessel with its bearing housings may be transported or moved from an operating station to a repair or maintenance station and, if desired, from the latter station to a hold station, and then returned to an operating station. The car has means for moving it into an aligned position with respect to the bottom of a converter vessel at any of the stations and for endwise moving the vessel after the second-mentioned end retainer of each of the pair of bearing housings has been removed.

3,603,574

SHOCK ABSORBER FOR INDEPENDENT FRONT WHEEL SUSPENSION

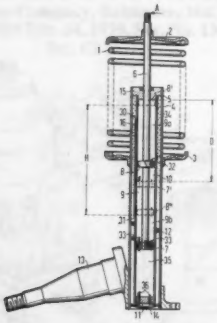
Dieter Lutz, Gildersheimer Strasse 76, 872 Schweinfurt am Main, Schweinfurt am Main, Germany

Filed July 24, 1969, Ser. No. 844,464

Claims priority, application Germany, July 30, 1968, P 17 80 074.7

Int. Cl. B60g *11/56*

U.S. Cl. 267—34 **10 Claims**



In a hydropneumatic shock absorber of the piston-and-cylinder type for a front wheel of a motorcar, an annular spacer mounted on the piston rod or on the inner cylinder wall between the piston and the end wall of the cylinder through which the piston rod passes limits radial deflection of the piston rod under stresses due to steering or to travel of the sprung wheel over an obstacle.

3,603,575

ADJUSTABLE VEHICLE-STABILIZING UNIT

David F. Arlasky, and Robert W. Chapman, both of Chicago, Ill., assignors to Chapman Performance Products, Inc., Chicago, Ill.

Filed July 7, 1969, Ser. No. 841,189

Int. Cl. F16f *5/00*

U.S. Cl. 267—34 **6 Claims**

A combined coil spring and shock absorber unit for vehicle suspension wherein the compression of the coil spring may be adjustable relative to the shock absorber to properly level the suspended vehicle.

3,603,576

HYDROPNEUMATIC SUSPENSION UNIT WITH AUTOMATIC LEVEL REGULATION

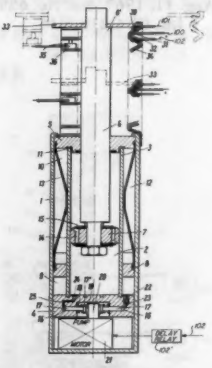
Erich Hahn, Ennepetal, Germany, assignor to Firma August Billstein, Ennepetal, Germany

Filed May 27, 1969, Ser. No. 828,297

Claims priority, application Germany, June 10, 1968, P 17 55 693.3

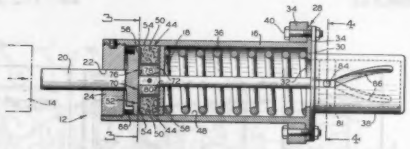
Int. Cl. F16f *5/00*

U.S. Cl. 267—64 **19 Claims**



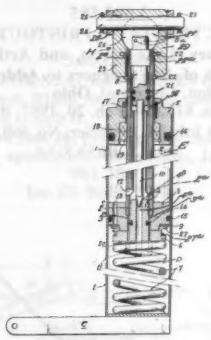
A self-pumping hydropneumatic suspension unit is provided with automatic level regulation operative even when the vehicle is stationary. The suspension-unit housing holds an electric pump-driving motor and also a regulating valve. A level-control switch electrically controls operation of the motor on the one hand and of the valve on the other hand in dependence on the vehicle load.

3,603,577
BUFFER DEVICE WITH TORSION BAR ACTUATED BRAKESHOES
Robert G. DeRaad, Garretson, S. Dak.
Filed Sept. 23, 1969, Ser. No. 860,284
Int. Cl. F16f *3/02*
U.S. Cl. 267—151 7 Claims



A buffer device includes a piston slidingly disposed in a cooperating cylinder so as to be displaceable therein by an energized, reciprocative member. A compression spring and a torsion bar are energized by the piston during displacement with the compression spring absorbing sufficient energy from the member to return it to its normal position, and the torque in the torsion bar being applied to a pair of brakeshoes carried by the piston so as to be actuated thereby against the inside of the cylinder to convert to heat the remaining energy imparted to the piston.

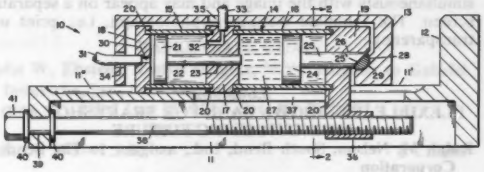
3,603,578
HYDRAULIC BALANCING MECHANISM
Jose Pardo Herrera, Avenida de las Torres 92, Zaragoza 9, Spain
Filed June 12, 1969, Ser. No. 832,748
Int. Cl. F16f *5/00*
U.S. Cl. 267—128 6 Claims



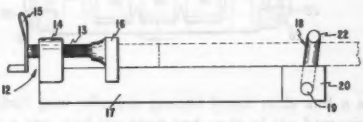
The invention provides an hydraulic balancing mechanism whereby elements or bodies may be oscillated to or from a utile and an inutile position and employs an hydraulic cylinder, a piston therein, a chamber above and a chamber below the piston, a spring in the lower chamber contacting the piston and compressible by movement of the cylinder relative to the piston, a bushing slidable in the piston having a bore, a slidable hollow rod carrying the bushing, there being communication between the chambers through said bore, the rod and a lateral opening in the latter, and valve means for said bore of the bushing operably mounted in the hollow of the rod.

3,603,579
FLUID-ACTUATED VISES
John E. Odom, 3112 Porter Street, Soquel, Calif.
Filed May 22, 1969, Ser. No. 826,901
Int. Cl. B25b *1/18*
U.S. Cl. 269—28 1 Claim

An elongated base having a fixed jaw at one end thereof. A movable jaw and its fluid actuator are slidable as a unit on the base for prepositioning the movable jaw relative to the fixed jaw. The fluid actuator consists of an air cylinder and a hydraulic cylinder in tandem. A piston in the air cylinder has a plunger projectable into the hydraulic cylinder for actuating a piston in the latter with a multiplication of force. The hydraulic cylinder piston has a piston rod which slides the movable jaw relative to the fixed jaw while the fluid actuator remains relatively stationary in its preadjusted position on the base.

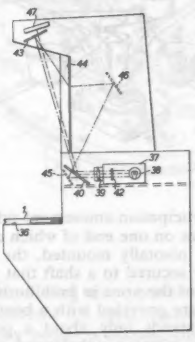


3,603,580
CLAMP HAVING GRIPPING MEANS
Harold Van Gelder, 6905 Adros Avenue, Van Nuys, Calif.
Filed June 25, 1969, Ser. No. 836,406
Int. Cl. B25b *5/00*
U.S. Cl. 269—42 3 Claims



A clamp having gripping means thereby allowing the clamp to hold long pieces of material together without the necessity of the clamp being of great length. The gripping means are easily releasable and comprise a U-shaped member having one leg journaled in a bar forming part of the clamp. The other leg of the U-shape is adapted to engage the workpiece to hold it.

3,603,581
POSITIONING AND SECURING OF WORKPIECES FOR MACHINING OPERATIONS
Philip Richard Christal, Deptford, England, assignor to The Molins Machine Company Limited, London, England
Filed Aug. 16, 1968, Ser. No. 753,204
Claims priority, application Great Britain, Aug. 23, 1967, 38864/67
Int. Cl. B23q *19/00*
U.S. Cl. 269—307 2 Claims



A method and apparatus for accurately locating a workpiece in positional relationship to a baseplate by projecting a

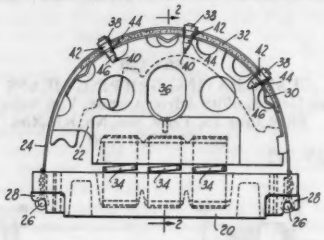
light image having contrasting areas representing areas or features of the workpiece, or supports or clamps, etc., for securing the workpiece to the baseplate. The light image may be that of a template having representational markings or may be of the workpiece of supports, clamps, etc., to be secured to the baseplate. Instructions may be displayed simultaneously with the image and may appear on a separate screen. The template may be a photograph, i.e., print or transparency.

3,603,582

FLEXIBLE HOLDDOWN BAND FOR BRAKESHOE AND LINING-HOLDING FIXTURE

Ralph M. Nelson, South Bend, Ind., assignor to The Bendix Corporation

Filed June 30, 1969, Ser. No. 837,523
Int. Cl. B23q *3/00*
U.S. Cl. 269—321 B **5 Claims**



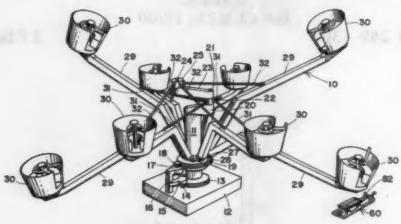
A flexible arcuate metal band having spaced-apart laterally extending flexible tab portions to which tapered locating pins are fixedly secured. The band is adapted to overlay a brakeshoe and associated brake lining with the tapered locating pins bearing against the edges of the shoe and lining to thereby accurately and positively fix the position of the lining relative to the shoe.

3,603,583

PASSENGER PARTICIPATION AMUSEMENT RIDE

Norman Bartlett, North Miami Beach, Fla., assignor to Marjorie Bartlett, North Miami Beach, Fla., a part interest

Filed Apr. 8, 1969, Ser. No. 814,251
Int. Cl. A63g *1/00*
U.S. Cl. 272—36 **7 Claims**



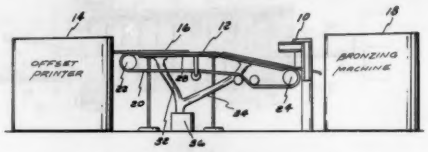
A passenger participation amusement ride having a plurality of radiating arms on one end of which circular passenger-carrying cars are pivotally mounted, the other end of the arms are pivotally secured to a shaft that permits the simultaneous swinging of the arms in both horizontal and vertical planes. The cars are provided with a bench for seating passengers, which extends only about a portion of the car whereby the cars become unbalanced when loaded with seated passengers so that rotation of the cars is effected as the cars rise and fall and ratchet mechanism connected to the cars so that the cars can only rotate in one direction.

3,603,584

CRIMPING MEANS FOR SHEET FEEDING APPARATUS

Joachim G. Schmidtke, 22518 Mylls Street, St. Clair Shores, Mich.

Filed Sept. 12, 1969, Ser. No. 857,477
Int. Cl. B65h *9/06*
U.S. Cl. 271—50 **7 Claims**



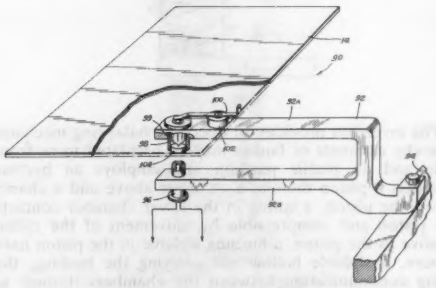
A conveyor having a plurality of spaced-apart closed-looped belts, the upper sides of which carry sheets of paper from a printing device to a sheet-processing machine, is provided with a feed table disposed between the end of the conveyor and the sheet-processing machine. The feed table has a crimping surface upon which the leading edge of each sheet is bent downwardly by a predetermined amount. A pivotally mounted stop member responsive to the position of the leading edge of the sheet momentarily prevents movement of the sheet relative to the crimping surface while a bar member spaced above and parallel to the crimping surface moves to and from the crimping surface to engage the upper surface of the leading edge of the sheet to crimp the same about the contour defined by the crimping surface.

3,603,585

PHOTOELECTROSTATIC PRINTOUT MACHINE

William R. Maloney, Lake Forest, and Arthur L. Hallquist, Mundelein, both of, Ill., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Division of Ser. No. 617,094, Feb. 20, 1967, Pat. No. 3,501,236.
Filed July 24, 1969, Ser. No. 869,983
Int. Cl. B65h *7/14*
U.S. Cl. 271—57 **12 Claims**

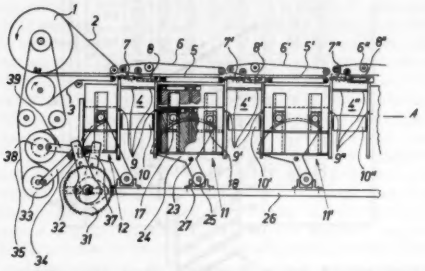


A photoelectrostatic printout machine for computers or terminals of communication links in which logic circuits coupled to detectors located at stations spaced along the path of movement of the copy sheet detect paper jams and skewed sheets. An abnormality stops sheet feeding and inhibits the transfer of image signals to the machine. The position of the light-sensitive copy sheets is photoelectrically detected using light to which the sheet does not respond.

3,603,586
STACKING APPARATUS

Lorenz Hupfauf, Fuerth, Germany, assignor to Vereinigte Flugtechnische Werke Fokker G.m.b.H., Bremen, Germany

Filed Feb. 25, 1970, Ser. No. 14,120
Claims priority, application Germany, Feb. 28, 1969, P 19 10 203.5
Int. Cl. B65h *31/24*
U.S. Cl. 271—64 12 Claims

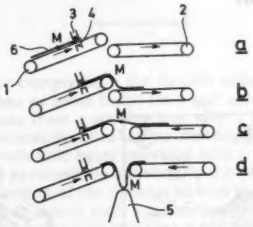


A stacking apparatus is disclosed having conveyor belts and chutes governed by flaps and containing blower nozzles for depositing blanks into the chutes. Stacking platform establishing horizontally extending rods move down in the chutes while similar rods move up but in a retracted position, to serve as platform for the next stack. The rods run in horizontally stacked guide plates serving also as partition between two adjacent chutes. Each guide plate supports two rods respectively for the two adjacent chutes. Adjacent plates in a stack are moved in opposite direction. A common drive for all plates is geared to the principal drive for the conveyor belts.

3,603,587
APPARATUS FOR STACKING HIDES OR THE LIKE

Cornelius Van Dorst, Rijen, Netherlands, assignor to Badische Maschinenfabrik G.m.b.H.

Filed Jan. 26, 1970, Ser. No. 5,857
Claims priority, application Netherlands, Jan. 27, 1969, 6 901 282
Int. Cl. B65h *29/34*
U.S. Cl. 271—65 14 Claims

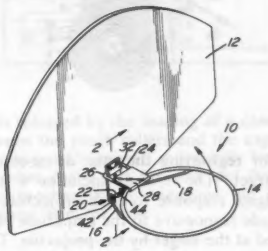


This apparatus is adapted to stack hides or the like of different lengths successively and centrally on each other so as to straddle the narrow head of an upwardly tapering hide support so that the two halves of each hide will be disposed at the front and rear sides of this support and the superimposed hides form a centrally folded stack which takes up very little space and is so accurately balanced on the head of the support that it will not tip over. The apparatus comprises a pair of conveyor belts behind each other, a scanning device, preferably a photoelectric cell, for measuring the length of each hide while traveling along the first conveyor belt and for thereby also determining the position of the center of each hide, and a control mechanism which is responsive to the actuation of the scanning device and controls the operation of the second conveyor belt which receives at least a part of the hide form the first belt and then moves the hide toward the hide support and deposits the hide centrally in the straddling position on the support or on the previously deposited hide.

3,603,588
BASKETBALL GOAL

John W. Ebstein, Roslyn Heights, N.Y., assignor to Gabriel Industries, Inc., New York, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,461
Int. Cl. A63b *63/02*
U.S. Cl. 273—1.5 R 8 Claims

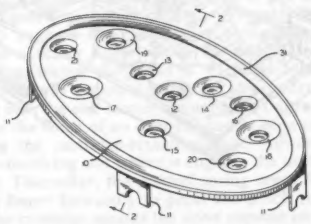


A basketball goal wherein spaced brace rods and a strut are fixed to a rim, and the strut and ends of the b race rods remote from the rim are fastened to a backboard by a unitary mounting plate. The upper portion of the mounting plate has a channel formed therein within which the strut is secured, and the lower portion of the mounting plate is formed with tabs, to which the brace rods are secured, when the goal is attached to a backboard.

3,603,589
POCKETED MARBLE GAME SIMULATING SPACE TRAVEL

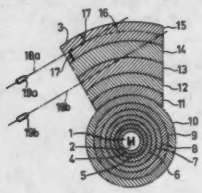
Geoge E. Sonntag, 10555 West Spencer Place, Milwaukee, Wis.

Filed Mar. 20, 1970, Ser. No. 21,441
Int. Cl. A63b *63/00*; A63f *7/14*
U.S. Cl. 273—95 R 5 Claims



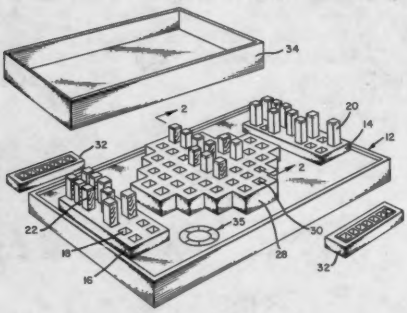
A marble game simulating space travel. Indentations in a playing surface represent 10 solar system bodies. Travel between the heavenly bodies is accomplished by shooting a marble from one indentation to another. Subgrooves represent such things as "Safe Landings," "Crash Landings" and "Lost in Space."

3,603,590
APPARATUS FOR RECORDING HIT RESULTS ACTIVATED BY SHOCK WAVES ENERGIZING HIT DETECTORS
Ulf Carl Iwar Sellman, Roslags-Nasby, Sweden, assignor to A B Flygmal Air Target Ltd., Stockholm, Sweden
Filed May 24, 1968, Ser. No. 731,895
Int. Cl. F41j 5/04
U.S. Cl. 273—102.2 B 5 Claims



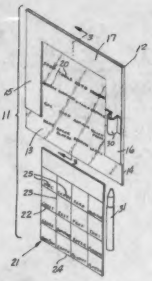
A system for registering the miss distance of projectiles shot at a target. The system includes a means which generates a signal response to each projectile, which signal has an amplitude responsive to the amplitude of the acoustic wave produced at the target by the projectile. The generated signal selectively energizes a plurality of zone-marking units, each of which is responsive to a different amplitude of the generated signal, which amplitude corresponds to a predetermined miss distance from the target. A recording means is operated for each projectile which caUses the generation of the signal in accordance with the response of the zone-marking units to thereby indicate for each projectile its miss distance from the target.

3,603,591
BOARD GAME APPARATUS
Philip L. Shoptaugh, 3317 Florida Street, Oakland, Calif.
Filed May 23, 1969, Ser. No. 827,379
Int. Cl. A63f 3/02
U.S. Cl. 273—131 AB 1 Claim



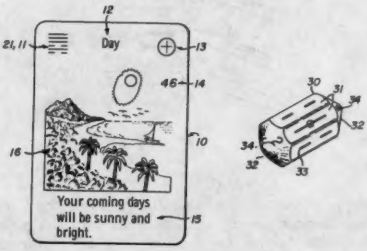
A board game apparatus which comprises plurality of playing pieces with distinctive body colors to designate the players and end colors which are different on each piece. The end colors are selected from adjacent spectral colors when a spectrum is arranged in a circular fashion with red being adjacent to both orange and violet and the other colors being blue, green and yellow arranged in spectral order. The apparatus further comprises a board having pockets which conceal the lower end color of the piece and expose the body color and the upper end color.

3,603,592
APPARATUS FOR PLAYING A GAME UTILIZING THE PERCEPTION OF TELEVISION COMMERCIALS
Joe Bury, 400 South 6th Street, Worland, Wyo.
Filed Jan. 20, 1970, Ser. No. 4,323
Int. Cl. A63f 3/00
U.S. Cl. 273—135 B 8 Claims



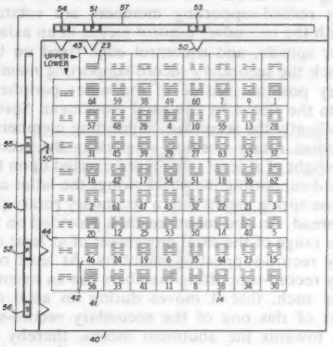
A game apparatus consisting of rectangular background cards having transparent front panels secured thereto at three edges, leaving an open edge. The transparent front panels have indicia which are of the same color as the background card. The indicia consists of rows and columns of generic names of products. Auxiliary cards inscribed with rows and columns of boxes containing trade names may be inserted between the transparent front panel and the background card, so that a trade name and product name will appear in each box. A crayon is furnished to mark a box when the product or trade name is mentioned in a television commercial, so that eventually a contestant can complete a horizontal, vertical, or diagonal row of markings, whereby he is entitled to a score value. The crayon markings are erasable to permit reuse of the background card assemblies.

3,603,593
I CHING FORTUNE-TELLING GAME
Kenneth Chew, 2629 Castello Way, Santa Clara, Calif.
Filed June 23, 1969, Ser. No. 835,920
Int. Cl. A63f 9/00
U.S. Cl. 273—161 2 Claims



A fortunetelling and competitive wagering game based upon the I Ching. Apparatus for the game includes 64 oracle cards, 3 octagonal dice and a selection board. Each card has displayed thereon a distinctive hexagram and a word, numeral, sign and fortunetelling sentence, each related to or ex-

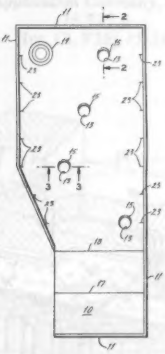
pressing an attribute associated with the hexagram. Each facet of each dice has a symbol corresponding to a component of a hexagram. The selection board has 64 regions in



an eight-by-eight array with each region having inscribed thereon a different hexagram. Pointers in slides are selectively alignable with columns and rows of the regions.

3,603,594
GOLF GAME

William D. Kelley, 20-A Valley Road, St. Charles, Mo.
Filed Feb. 16, 1970, Ser. No. 11,653
Int. Cl. A63b *67/02*
U.S. Cl. 273—176 F **3 Claims**

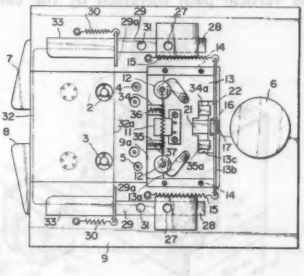


A golf game comprising a flat flexible cellular playing surface having one or more holes (in a golf sense) at predetermined distances from a starting line with a flexible resilient stop bar permanently attached to the edges of the playing surface and each hole being provided with a flexible resilient retaining wall permanently attached to the playing surface at and along a portion of the lip edge of said hole furthest away from the starting line in such a manner so as to deflect a ball into the hole if driven with less than a predetermined amount of force but allowing the ball to continue on its course without deflection if the force so applied exceeds the predetermined amount of force.

3,603,595
MAGNETIC SOUND RECORDING AND REPRODUCING APPARATUS

Eiichi Wada, Yokohama-shi, Japan, assignor to Mondo Kabrishiki Kaisha, Tokyo-to, Japan
Filed Feb. 27, 1969, Ser. No. 802,892
Claims priority, application Japan, Mar. 1, 1968, 43-13275
Int. Cl. G11b *5/00*
U.S. Cl. 274—4 E **2 Claims**

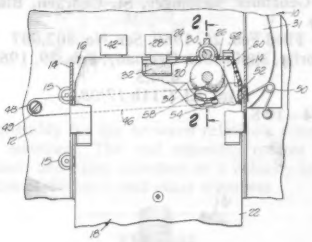
In a tape recorder, a magnetic sound recording and reproducing head and pinch rollers are mounted on a plate member which is moved forwardly in response to the upward movement of an elevator frame including a driving means for upright reel driving shafts and capstans, and is moved rearwardly by a spring. The capstans and the head are moved forwardly in response to the upward movement of the elevator



frame which is released by the loading of a cassette to clamp the tape between the pinch rollers and the capstans and the plate member is quickly moved rearwardly by means of an operating member for a fast forward and fast rewind and quick running mechanism to disengage the head and the pinch rollers away from the tape.

3,603,596
CARTRIDGE-RETAINING MECHANISM FOR TAPE DECKS AND THE LIKE

George H. Eash, 3546 Alginet Drive, Encino, Calif.
Filed Nov. 3, 1969, Ser. No. 873,340
Int. Cl. G11b *5/00*
U.S. Cl. 274—4 B **3 Claims**



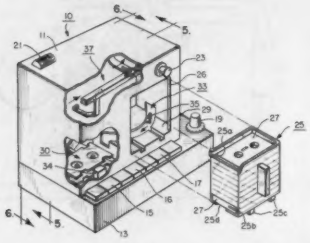
An improved cartridge-retaining mechanism for magnetic tape decks (i.e., players and transcribers) and the like is actuated automatically by the insertion of a magnetic tape cartridge into the cartridge-receiving slot of the deck. A lever arm swingably mounted (e. g., pivotably or rotatably mounted) beneath the cartridge-receiving slot of the deck carries an actuator finger which normally extends into the cartridge receiving slot, and a cartridge-retaining finger which is normally disposed below the slot. Insertion of a tape cartridge into the slot moves the actuator finger forwardly to overcome the force of an over-the-center-type control spring and bring the cartridge-retaining finger upwardly into the cartridge-receiving slot where it engages the underside of the cartridge. Thereafter, the control spring urges the cartridge-retaining finger forwardly to press the pinch roller and the tape in the cartridge against the drive capstan on the deck.

3,603,597
TAPE RECORDER

Robert Haake, Pasadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.
Filed Apr. 25, 1969, Ser. No. 819,299
Int. Cl. G11b *5/00*
U.S. Cl. 274—4 F **46 Claims**

A tape recorder is disclosed for automatically playing a succession of tape cassettes of the type having separately

reproducible record tracks. A carrier supports one cassette at the play station for reproduction of a first set of record tracks after which a control is actuated to lift the carrier away from the play station, invert the cassette and return the cassette to the play station for reproduction of the second and last set of record tracks. A storage bin holding a plurality of cassettes in stacked relation is positioned laterally adjacent the play station and the vertical path traversed by the carrier in its

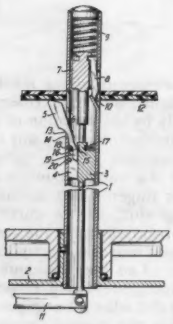


operating cycle. On its next operating cycle, the carrier momentarily dwells at positions respectively adjacent the top and bottom of the bin while an injector mechanism transfers the one cassette from the carrier into the bin and an ejector lever transfers a successive cassette from the bin into the carrier to permit play of a successive cassette. The storage bin is preferably removable from the recorder and is constructed so as to serve as a convenient, independent storage vehicle for a series of cassettes. Additional features are disclosed.

3,603,598
PILE AXLE

Helmut Laufer, St. Georgen, Black Forest, Germany, assignor to Dual Gebruder Steidinger, St. Georgen, Black Forest, Germany

Filed Feb. 25, 1969, Ser. No. 802,007
Claims priority, application Germany, Feb. 29, 1968, P 16 22 054.5
Int. Cl. G11b *17/08*
U.S. Cl. 274—10 S **4 Claims**

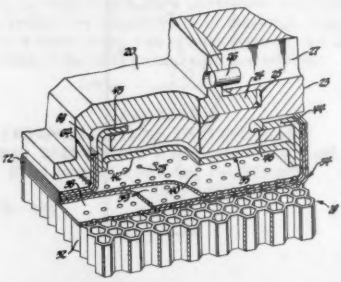


A center spindle for a record-changing phonograph which comprises a sleeve having a plurality of axially directed slots disposed in two groups at different heights, and primary control means are provided in the sleeve and operable by an axial movement thereof. A plurality of primary record-supporting members are each placed in one of the slots of the upper of the groups and coupled with the primary control means such, that the primary record-supporting members are movable into a position outside of the outer periphery of the sleeve by the axial movement. Secondary control means are arranged in the sleeve and operable by an axial movement thereof. A plurality of secondary record-supporting members comprises obliquely upwardly arranged stays and each is placed in one of the slots of the lower of the groups; the upper end of the secondary record-supporting members, corresponding with about the thickness of one record. The secondary record-supporting members are rotatably connected with the secondary control means in an axial plane of the center spindle, and a control edge fixed on the sleeve swings back the secondary record-supporting members from one rotary position outside of the outer periphery of the sleeve into the sleeve by the axial movement. Spring means retain resiliently the secondary supporting members in a primary, median rotary position supporting the records such, that the weight of at least one record exerted upon the secondary record-supporting members swings the latter against the force of the spring means into a secondary rotary position of greater spread. An abutment means is provided on the sleeve within the range of the axial movement of at least one of the secondary record-supporting members. At least one of the secondary record-supporting members has an extension at its lower end such, that it moves during an axial downward movement of this one of the secondary record-supporting members towards the abutment means, thereby locking a further movement of the secondary control means, when the secondary record-supporting members are disposed in their primary, median rotary position, and the secondary record-supporting members pass freely the abutment means, upon moving into their secondary rotary position.

3,603,599
COOLED SEAL

William F. Laird, Waldron, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 6, 1970, Ser. No. 35,213
Int. Cl. F01d *11/08;* **F02f** *11/00*
U.S. Cl. 277—53 **6 Claims**



A cooled blade tip seal strip in a turbine has a facing of honeycomb material underlaid by a sheet of porous material to which the honeycomb is bonded. The porous material has numerous distributed pores which conduct fluid from a chamber between the sheet and a structure on which it is mounted through the sheet and the honeycomb cells to provide cooling for the blade tip seal in the hot environment of the turbine.

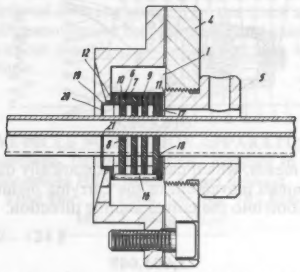
3,603,600
BORER SEAL

Adolf Lutz, Geisingen Andei, Germany, assignor to Karl Huller, GmbH, Germany

Filed Sept. 23, 1968, Ser. No. 761,566
Claims priority, application Germany, Sept. 27, 1967, H 60333
Int. Cl. F16j *15/56*
U.S. Cl. 277—81 **11 Claims**

A borer seal, especially for bore hole tubes, which includes a plurality of coaxially arranged sealing discs arranged in axially spaced relationship to each other and provided with a

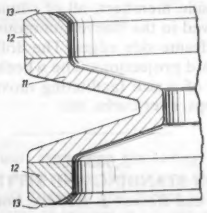
central opening therethrough corresponding to the circumferential contour of the borer in connection with which the seal is to be used, and means connecting said sealing discs to each other to a single structural unit.



3,603,601
METALLIC RUBBING RING SEAL FOR ROTATABLE SHAFT PASSAGEWAYS IN APPARATUS WHICH, DURING USE, CONTAIN LIQUID MEDIA

Walter Blomeyer, Wolfgang, and Peter Saul, Lauterbach (Hessen), both of, Germany, assignors to Vickers-Zimmer Aktiengesellschaft Planung und Bau von Industrieanlagen, Frankfurt (Main), Germany

Filed Sept. 17, 1969, Ser. No. 858,665
Claims priority, application Germany, Sept. 17, 1968, P 17 75 727.6
Int. Cl. F16j *15/34*
U.S. Cl. 277—83 **3 Claims**



A liquidtight expandable metallic seal for a rotating shaft extending through the wall of an apparatus, said seal being interposed between opposed sealing surfaces in the wall and in a shoulder on the shaFt. The seal is made of spring metal and V-shaped in cross section with the free ends terminating in rubbing rings lying against the sealing surfaces. The center line of the V-shaped section is perpendicular to the axis of the shaft. By moving the shaft axially with respect to the wall, the space between the sealing rings may be adjusted to compress the expandable seal to compensate for wear.

3,603,602
REINFORCED SEAL

Lawrence D. Padula, New Britain, Conn., assignor to Skinner Precision Industries, Inc., New Britain, Conn.

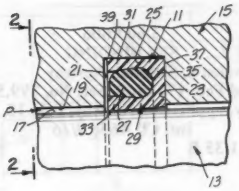
Continuation-in-part of application Ser. No. 697,389, Jan. 12, 1968, now abandoned. This application Nov. 28, 1969, Ser. No. 880,787
Int. Cl. F16j *15/02*
U.S. Cl. 277—164 **8 Claims**

A composite O-ring-type seal having a molded elastomeric body and a reinforcing spring embedded therein to prevent excessive deformation of the elastomeric body and in which the molded elastomeric body is contoured to provide for accurately locating the reinforcing spring within the body and to provide opposed annular sealing ribs for providing effective sealing.

3,603,603
ROTATING SEAL ASSEMBLY

Leslie A. Woodson, Long Beach, Calif., assignor to W. S. Shamban & Co., Los Angeles, Calif.

Filed Sept. 16, 1969, Ser. No. 858,393
Int. Cl. F16j *15/54*
U.S. Cl. 277—165 **14 Claims**



A seal assembly for use between relatively rotatable inner and outer members. The seal assembly rotates relative to both the inner and outer members at a velocity intermediate the velocities of the inner and outer members.

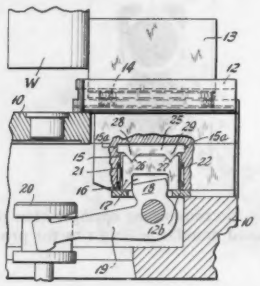
3,603,604
PIPE FITTING

Peter I. Campbell, Warwickshire, England, assignor to C. E. and J. P. Britton Limited, Birmingham, England

Filed July 30, 1969, Ser. No. 846,126
Int. Cl. F16j *15/10*
U.S. Cl. 277—209 **9 Claims**

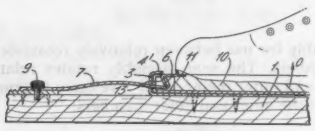
A seal between a pipe and a socket in which one end of the pipe is adapted to be received is formed by at least one annular membrane or diaphragm carried by the ring and relative to which the pipe is slidable axially when the pipe and socket are slidably engaged.

3,603,605
ANTILIFT DOUBLE-ACTING CHUCK
Benjamin C. Webster, Jr., 82 Birchwood Drive, Fairfield, Conn.
Filed Oct. 22, 1969, Ser. No. 868,357
Int. Cl. B23b *31/16*
U.S. Cl. 279—1 DA **6 Claims**



A chuck having a main body provided with slides carrying jaws capable of I.D. or O.D. chucking with each slide provided with a binder member or plate automatically operable, in response to a predetermined partial clamping or chucking pressure applied by the jaw to the workpiece, to draw said slide downwardly on said main body and prevent the jaw from lifting the workpiece from its support and to seal said slide against entry of foreign material.

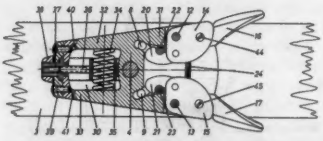
3,603,606
SKI BINDING
Nils Eie, Tennisveien 6, Slemdal, Norway
Filed Feb. 17, 1969, Ser. No. 799,582
Claims priority, application Norway, Feb. 15, 1968, 581/68
Int. Cl. A63c *9/16*
U.S. Cl. 280—11.35 B **5 Claims**



A ski binding comprises a toe iron secured to a ski for receiving the toe portion of a boot and having inwardly turned upper edge portions for engaging the upper surface of the sole of the boot at the toe portion. The boot carries a forwardly extending engagement member which is automatically engaged with a fastening device solely upon insertion of the toe portion of the boot in the toe iron. The fastening device is constituted by a resilient spring blade which is attached at its rear end and extends forwardly so as to be gradually depressed and stressed by insertion of the toe portion of the boot in the toe iron. The spring blade carries a protrusion on the upper surface thereof which is adapted to engage with a bent front portion of the engagement member on the boot.

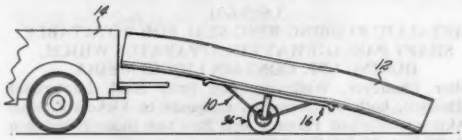
3,603,607
TOE IRON FOR SAFETY SKI BINDINGS
Hannes Marker, and Albert Gustav Oehlmann, both of Garmisch-Partenkirchen, Germany
Filed Sept. 19, 1968, Ser. No. 760,861
Claims priority, application Germany, Sept. 28, 1967, P 15 78 858.6
Int. Cl. A63c *9/085*
U.S. Cl. 280—11.35 T **11 Claims**

Two soleholders are pivoted on vertical axes to a common carrier and laterally engage the toe portion of the skiing boot above the sole. The soleholders are normally locked against a pivotal movement. The carrier is mounted for pivotal movement against spring force on a toe iron part that is fixed to the ski. The carrier has for each soleholder a deflection-



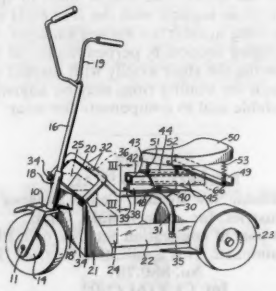
preventing means, which can be automatically disabled after a predetermined movement of the carrying member from its central position into the corresponding direction.

3,603,608
DOLLY FOR HANDLING LONG HEAVY OBJECTS
George A. Kirkpatrick, P.O. Box 693, Ridgecrest, Calif.
Filed Aug. 12, 1969, Ser. No. 849,938
Int. Cl. B60p *3/40;* **B62b** *1/00*
U.S. Cl. 280—47.13 R **1 Claim**



A lightweight dolly is provided for handling a long, heavy object, such as a roll of carpet, padding, linoleum and the like, by one person. The dolly has a generally rectangular frame of round tubular material for cradling the object and consisting of straight sides, downwardly bent ends and rounded corners. Dependingly joined to the frame within the side edges thereof is a support structure including a pair of V-shaped members, a transverse sleeve and braces between the sleeve and side members, all of round tubular material. An axle is received in the sleeve and mounts a pair of wheels inwardly of the frame side edges. The dolly is thus devoid of lateral and upward projections. The wheels are provided with pneumatic tires of a size facilitating movement of the dolly up and down steps, over curbs, etc.

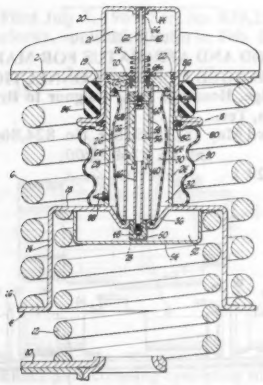
3,603,609
COMBINATION STANDING AND SITTING STRUCTURE
Ion V. K. Hott, and Robert J. Haddix, both of Dayton, Ohio, assignors to The Joyce-Cridland Company, Dayton, Ohio
Filed May 8, 1969, Ser. No. 823,018
Int. Cl. B60n *1/02*
U.S. Cl. 280—62 **9 Claims**



A vehicle having at least three wheels is provided with a frame base including an upwardly inclined forward portion

and a substantially flat rearward platform portion to which a Y-shaped tubular support is secured by only three fasteners. A beam is carried intermediately upon the tubular support and has a track readily slidable on the beam. A seat resiliently mounted on the track is readily slidable back and forth on the beam for alternately sitting on the seat to impart tilt with frictional interengagement of the track and beam to prevent sliding movement therebetween and standing on the platform without troublesome release of seat bolts with a wrench or tools.

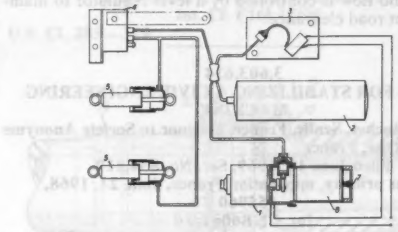
3,603,610
VEHICLE SUSPENSION APPARATUS
Tom H. Thompson, Dearborn, Mich., assignor to Clifford W. Mezey, Bloomfield Hills, Mich., a part interest
Filed Dec. 20, 1968, Ser. No. 785,656
Int. Cl. B60g *11/58*
U.S. Cl. 280—124 F **39 Claims**



Vehicle suspension apparatus including a plurality of springs in series for supporting the sprung mass of a vehicle on the unsprung mass thereof, and means for increasing the spring rate of the series of springs in response to increases in static load on the series of springs. Hydropneumatic means cooperates with one spring of the series to resiliently resist movement of a pair of relatively movable members toward each other, and responds to static deflection of the associated spring caused by such movement to restore the members to a minimum spacing and the spring to a corresponding minimum static length, and thereafter provides increased resistance to subsequent deflection of the spring from the minimum length until the static load on the series of springs is reduced.

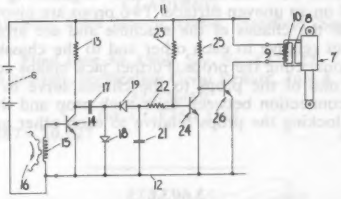
3,603,611
VEHICLE-LEVELLING SYSTEMS
Graham J. Wenham, Tyseley, Birmingham, England, assignor to Girling Limited
Filed May 19, 1969, Ser. No. 825,844
Claims priority, application Great Britain, June 6, 1968, 27,032/68
Int. Cl. B60g *11/26*
U.S. Cl. 280—124 **5 Claims**

This invention relates to a pneumatically operable automatic levelling system for a motor vehicle including a motor/compressor/dryer unit, a reservoir for storing air under pressure, at least one vehicle-levelling strut, a valve for controlling the flow of air under pressure to and from the strut to maintain the vehicle level, and a pressure-sensitive switch for



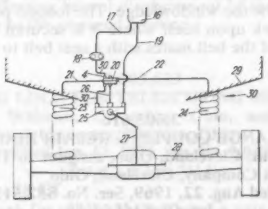
switching off the motor of the unit when the pressure of air in the reservoir reaches a preset upper limit.

3,603,612
SUSPENSION SYSTEMS FOR ROAD VEHICLES
William Frank Hill, Stafford, and Lancelot Phoenix, Birmingham, both of, England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England
Filed July 24, 1969, Ser. No. 844,289
Claims priority, application Great Britain, July 29, 1968, 36025/68
Int. Cl. B60g *9/00*
U.S. Cl. 280—124 F **1 Claim**



In a road vehicle suspension the damping of the system is greater at high speeds than low speeds. Typically, a plurality of shock absorbers having adjustable damping characteristics are used, and electromagnetic means adjust the damping characteristic of each shock absorber under the control of speed responsive means so that the damping is increased above a predetermined speed of the vehicle.

3,603,613
VEHICLE LEVEL CONTROL
Hans Erdmann, Neu Isenburg II, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed July 7, 1969, Ser. No. 839,257
Claims priority, application Germany, July 26, 1968, P 17 80 049.6
Int. Cl. B60g *17/04*
U.S. Cl. 280—124 **5 Claims**



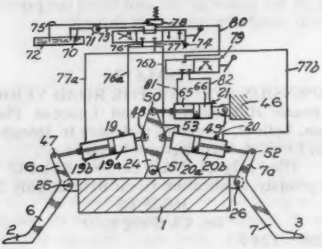
A vehicle level control system for vehicles in which fluid pressure springs on each side of an axle are connected in

parallel to a supply conduit for raising the vehicle and in parallel to a discharge conduit for lowering the vehicle. A check valve system in the parallel conduits prevents cross flow between the fluid pressure springs to stabilize the vehicle. The fluid flow is controlled by a level regulator to maintain a preset road clearance.

3,603,614
MEANS FOR STABILIZING A CIVIL ENGINEERING MACHINE

Yves M. Gauchet, Senlis, France, assignor to Societe Anonyme Poclain, Oise, France

Filed June 19, 1969, Ser. No. 834,819
Claims priority, application France, June 21, 1968, 155960
Int. Cl. B60s *9/10*
U.S. Cl. 280—150.5 **10 Claims**

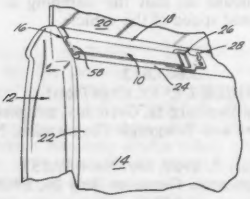


Apparatus for stabilizing a civil engineering machine mounted on an uneven surface. Two props are pivotally connected to the chassis of the machine and are arranged for movement relative to each other and to the chassis by jack means connecting the props. Further jack means connecting at least one of the props to the chassis serve to lock the pivotal connection between each such prop and the chassis thereby locking the props relative to each other and to the chassis.

3,603,615
VEHICLE SAFETY BELT DEVICE

John L. Stehouwer, 425 Russwood Street N. E., Grand Rapids, Mich.

Filed Sept. 24, 1969, Ser. No. 860,569
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 SB **2 Claims**



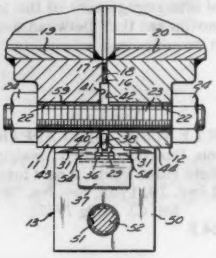
An improved safety belt device utilizing a belt looped around a bar welded or otherwise affixed to the vehicle door within the same, positioned at the rear of the door immediately below the windowledge. The looped portion of the belt comes back upon itself where it is secured by stitching. The free end of the belt mates with a seat belt to retain a passenger.

3,603,616
FLANGE COUPLING REPAIR RING

Joseph B. Smith, Cleveland, Ohio, assignor to The Pipe Line Development Company, Cleveland, Ohio

Filed Aug. 22, 1969, Ser. No. 852,513
Int. Cl. F16l *55/18*
U.S. Cl. 285—15 **5 Claims**

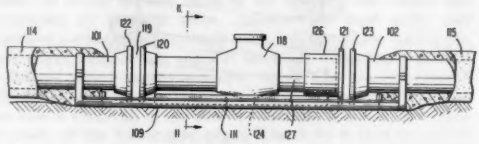
Locating and aligning lug means are provided for a type of coupling used in the repair of leaking flanged pipe joints which index the coupling to the center of the joint, permitting the coupling length to be independent of the length of the joint.



3,603,617
METHOD AND APPARATUS FOR MAKING SUBMERGED CONDUIT CONNECTIONS

Joe C. Lochridge, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed May 15, 1969, Ser. No. 824,866
Int. Cl. F16l *35/00*
U.S. Cl. 285—24 **11 Claims**



A submerged assembly including longitudinally spaced first and second conduit means, extending between the conduit means and a template carried by the first and second conduit means. By removing the spacer means, a fitting may be installed between the first and second conduit means, with the alignment of the fitting being facilitated by the template means.

Jack-type flange fittings and telescoping joints may be employed to facilitate the removal of the spacer means and subsequent installation of the fitting.

A method for installing a submerged fitting wherein a conduit means is initially positioned with conduit portions spaced by removable spacer means. When the conduit means is disposed in its submerged location, the spacer means is removed. A template carried between the conduit portions facilitates the positioning of a fitting between the conduit portions.

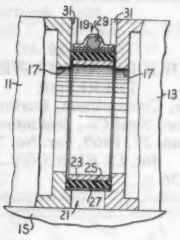
3,603,618
SEAL ASSEMBLY

Michael K. Stratton, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 1, 1969, Ser. No. 811,973
Int. Cl. F16l *25/00*
U.S. Cl. 285—31 **7 Claims**

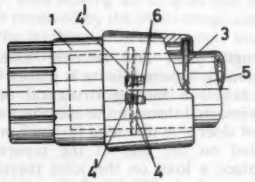
A connector and seal assembly consisting of a ferrule within a rubber seal which, in turn, is surrounded by an ad-

justable band. Tightening of the band causes the rubber seal



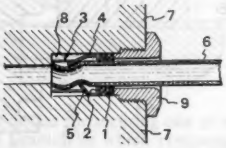
to be extruded outwardly from between the band and the ferrule.

3,603,619
CLAMP COUPLING
Karl Bengesser, Fraghes No. 6, Klausen, Province of Bolzano, Italy, and Karl Garbislander, Mitterweg 95, Innsbruck, Austria
Filed July 7, 1969, Ser. No. 839,210
Claims priority, application Austria, Feb. 26, 1969, A 1931/69
Int. Cl. F16l *11/12*
U.S. Cl. 285—45 4 Claims



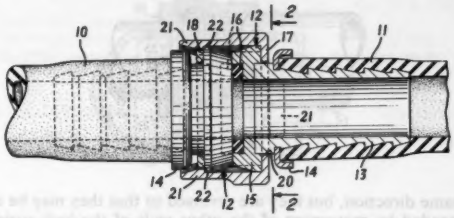
A quick-connect pipe coupling consisting of a socket having three inner sections of different bore diameters, at least one clamping ring and one seal O-ring positioned within the bores, whereby the two radially extending free ends of the clamping ring extend through and may be operated in apertures located in the wall of the socket.

3,603,620
TUBE JOINT COUPLING
Yoshihiro Nakata, 1169 Iwase, Osawa-machi, and Testuo Kukuminato, 684 Chigusashinder, Osawa-machi, both of Kimitsu-gun, Chiba-ken, Japan
Filed June 6, 1969, Ser. No. 830,997
Claims priority, application Japan, June 24, 1968, 43/55915
Int. Cl. F16l *33/20*
U.S. Cl. 285—189 4 Claims



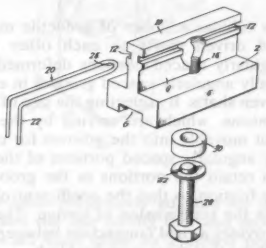
A pipe joint wherein a clamp ring having a pair of inwardly bent claws having different lengths is securely held in position in a joint main body through a gasket by a securing member so that a soft or ductile pipe inserted is bent by the pair of claws, sealed by the gasket and securely held in position by the clamp ring and the gasket as the fluid pressure of the fluid flowing through the pipe expands it radially outwardly.

3,603,621
HOSE COUPLING
Frederick L. Parsons, 759 Morningside Rd., Ridgewood, N.J.
Filed Oct. 27, 1969, Ser. No. 869,613
Int. Cl. F16l *37/00*
U.S. Cl. 285—319 3 Claims



A quick locking and releasing coupling for a pair of members to be coupled together including resilient coupling means projecting from each member to be coupled and snap-locking with the other member to be coupled and a raised cam engageable with the resilient coupling means when they are twisted or rotated relatively to each other to spread the resilient coupling means and release the member with which it was locked.

3,603,622
FIXING DEVICES FOR STRUCTURAL MEMBERS AND CLADDING
Adrian Anthony Cecil March, Oklea, Hartfield, Sussex, England
Filed June 30, 1969, Ser. No. 837,727
Claims priority, application Great Britain, July 4, 1968, 32,036/68
Int. Cl. F16b *3/04*
U.S. Cl. 287—20.927 6 Claims

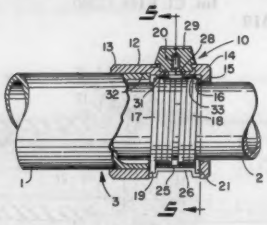


A fixing device for securing roof members such as cladding panels to the main frame members of a building said roof members having a fixing channel provided with a longitudinally disposed engageable formation said fixing device having a tongue for entry into said channel, a laterally displaceable complementary member mounted on said tongue for engagement with said formation in said fixing channel and wedging means for example a screw associated with said device for effecting lateral displacement of said complementary member to the engaged position.

3,603,623
SPRING LOCK FOR TELESCOPING MEMBERS
Michael U. Widman, Columbus, Ohio, assignor to The Wooster Brush Company, Wooster, Ohio
Filed Jan. 12, 1970, Ser. No. 2,043
Int. Cl. F16b *7/14*
U.S. Cl. 287—58 CT 8 Claims

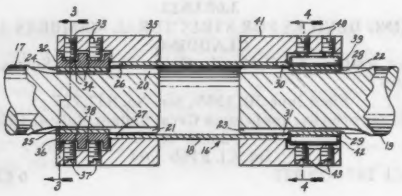
A spring lock for releasably retaining a pair of telescoping members in adjusted longitudinal and rotational orientation including a pair of coil lock springs disposed around the inner member and having one end fixed with respect to the

outer member. The lock springs normally frictionally engage the outer surface of the inner member, and are wound in the



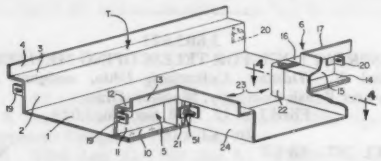
same direction, but they are reversed so that they may be expanded by movement of the other ends of the lock springs toward each other to release the inner member.

3,603,624
ANTIBACKLASH COUPLING
Lawrence A. Attermeyer, Cincinnati, Ohio, assignor to The Cincinnati Milling Machine Co., Cincinnati, Ohio
Filed July 9, 1969, Ser. No. 840,333
Int. Cl. F16d 1/00
U.S. Cl. 287—109 **22 Claims**



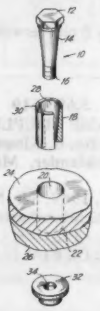
A hollow tubular member of a ductile material connects driving and driven shafts to each other through having equally angularly spaced portions deformed for disposition within equally angularly spaced grooves in each of the driving and driven shafts. By selecting the size of the grooves and retaining means, which are carried by the hollow tubular member but movable into the grooves for cooperation with the equally angularly spaced portions of the hollow tubular member to retain the portions in the grooves, there is no reliance on friction so that the coefficient of friction can be exceeded in the transmission of torque. The hollow tubular member provides a rigid connection between the driving and driven shafts so that there is no backlash.

3,603,625
TRENCHDUCT CONNECTOR UNITS
Michael J. Cottrell, Washington, W. Va., and Frederick W. Hudnall, Radford, Va., assignors to Textron Inc., Providence, R.I.
Filed May 18, 1970, Ser. No. 38,070
Int. Cl. F16b 7/18
U.S. Cl. 287—189.36 **7 Claims**



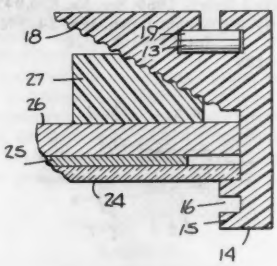
A unit used for interconnecting trenchduct runs which are in X- or T- or L-type patterns, the unit having one or more specially configured side rails which, in combination with post members, forms one or more openings adapting the unit for the particular pattern desired.

3,603,626
HIGH-STRENGTH JOINT AND FASTENER ASSEMBLY THEREFOR
Roger B. Whiteside, Cinnaminson, Burlington, N.J., assignor to Standard Pressed Steel Co., Jenkintown, Pa.
Filed Jan. 27, 1969, Ser. No. 794,123
Int. Cl. F16b 5/00
U.S. Cl. 287—189.36 **4 Claims**



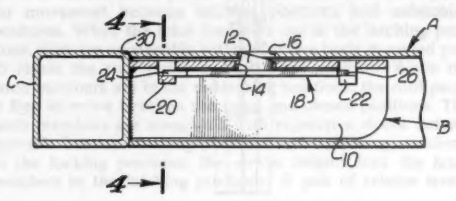
A high-strength joint and fastener assembly therefor wherein an internally tapered sleeve is placed within substantially aligned bores in mating structural members and a tapered bolt is inserted through the members and into the internally tapered sleeve. A threaded fastener member, such as nut, is threaded on the end of the tapered bolt and is tightened to place a load on the joint thereby radially expanding the tapered sleeve outwardly within each of the bores in the structural members to compensate for variations in the holes due to out of roundness of the holes, misalignment between holes in each structural member, or variations in hole diameter tolerances.

3,603,627
PICTURE FRAME STRUCTURE
Michael Kaffel, 321 E. 69th St., New York, N.Y.
Filed Dec. 15, 1969, Ser. No. 884,881
Int. Cl. F16b
U.S. Cl. 287—189.36H **2 Claims**



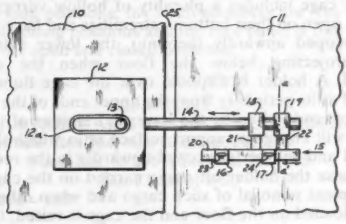
Picture frame formed of extruded vertical and horizontal elements wherein a corner bracket cooperates with channels molded into the profile of the vertical and horizontal frame elements to hold the elements firmly in assembled position and serrated wedges are provided for demountably holding a framed picture in the assembled frame elements.

3,603,628
FRAME CONNECTOR STRUCTURE
Edward A. Smith, 6641 W. 6th St., Los Angeles, Calif., and Robert L. Day, Burbank, Calif.
Filed July 7, 1969, Ser. No. 839,429
Int. Cl. F16b 7/00
U.S. Cl. 287—189.36H 6 Claims



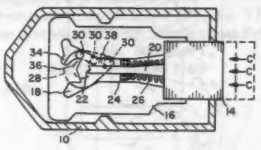
A tubular frame element is telescoped over a bracket to which it is to be connected. The frame element has an aperture for receiving a latching projection. The projection is formed on a strip of spring steel held against the inside surface of the bracket. The strip has its opposite ends held by straps struck inwardly from the bracket. The strip is formed so that it may be assembled by inserting one end of the strip under one strap, then bowing the strip so that its other end is positioned to be received by the other strap, and then shifting the strip until the latching projection snaps into an aperture of the bracket whereby the strip is locked in place. The anchoring of the strip at places spaced closely on opposite sides of the projection provides a stiff spring action adequate to ensure against accidental release of the connector structure.

3,603,629
GATE-CLOSURE DEVICE
Edward F. Windham, Plantation, Fla., assignor to General Safety Inc., Fort Lauderdale, Fla.
Filed Nov. 28, 1969, Ser. No. 880,553
Int. Cl. E05c 1/04; E05b 15/02
U.S. Cl. 292—145 4 Claims



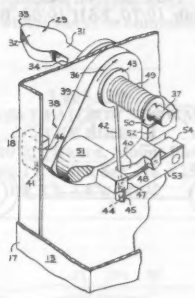
A gate-closure device for securing one or more gate members in a closed position in which compensation for variations in the lateral distance between the gate members is achieved comprising a slidable bolt and associated housing mounted on a first gate member, a keeper fixedly mounted upon an adjacent support member or second gate member, and a laterally moveable bolt retaining means adjustably mounted on said keeper allowing lateral positioning with respect to said keeper to provide compensation for variations in the separation distance between gate members. The closure device may be used even when the gate members are overlapped.

3,603,630
AUTOMATIC DEADLOCKING LATCHBOLT FOR A RIM LOCK
Mathias M. Check, 34 Bowman Drive, Greenwich, Conn.
Filed Aug. 28, 1967, Ser. No. 663,872
Int. Cl. E05c 1/12
U.S. Cl. 292—169.15 6 Claims



A rim lock provided with an automatic deadlocking feature made operational by either closing the door with the latchbolt fully extended or by the unauthorized prying or forcing of the extended latchbolt partially out of the strike in a closed door.

3,603,631
PUSH TO RELEASE LATCH FRICTION TYPE
Frederick M. White, Louisville, Ky., assignor to General Electric Company
Filed Apr. 28, 1969, Ser. No. 819,545
Int. Cl. E05c 13/00
U.S. Cl. 292—220 5 Claims

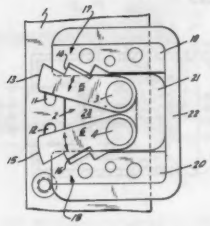


A push release latch particularly adapted for use on appliance cabinets and the like having first and second members movable toward each other to a closed position and away from each other to an open position, is provided comprising a first latch element carried by the first member, and a second latch element carried by the second member. At least one of the latch elements is adapted for rotation relative to the other latch element between a latched position and an unlatched position. At least one of the latch elements has a cam means associated therewith for rotating at least one of the latch elements toward the unlatched position when the members are moved toward each other from the closed position. By this arrangement, the members may be released by the latch from the closed position by moving the members toward each other from the closed position.

3,603,632
VEHICULAR DOOR LATCH
Johann Grass, Heiligenhaus, Germany, assignor to Firma Arn. Kiekert Sohne, Heiligenhaus, Germany
Filed Mar. 17, 1969, Ser. No. 807,519
Claims priority, application Germany, Mar. 29, 1968, P 17 03 084.1
Int. Cl. E05c 3/34
U.S. Cl. 292—224 6 Claims

Two pawls are pivoted next to each other and biased away from each other on the edge of a vehicle door while a chan-

nel member capable of receiving these pawls is formed on the doorpost. The pawls have outwardly directed teeth and the sides of the channel each have a mating tooth formation.

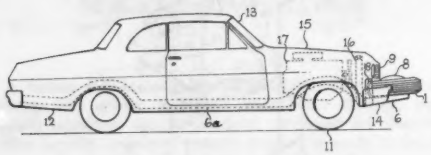


The channel partially encloses the pawls which are pivoted on a block on the door edge. A mechanism is provided to move these pawls toward and away from each other to operate the latch and to lock the latter.

3,603,633
SHOCK-ABSORBING TIRE BUFFER

Cheston Lee Eshelman, 621 N.E. 30 Terrace, Miami, Fla.

Continuation-in-part of application Ser. No. 748,785, July 30, 1968, now Patent No. 3,502,362. This application Aug. 11, 1969, Ser. No. 848,903
Int. Cl. B60r *19/10*; **B61f** *19/04*; **B61q** *11/12*
U.S. Cl. 293—19 **6 Claims**



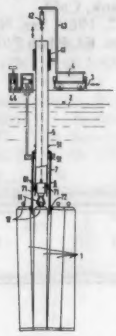
In an automotive highway vehicle, a frame, a transverse structure rigidly connected across the front end of the frame, said structure including a first rigid transverse member having a forwardly facing recess and a second rigid transverse member which also extends forwardly of the first member; a plate mounted on the second member, an elongated slot in the plate, a hub mounted on the plate with means permitting it to slide thereon the length of the slot; a spare wheel and tire mounted substantially horizontally on the hub with the rear portion of the tire nested in the recess.

3,603,634
CENTERING DEVICE FOR NUCLEAR REACTOR LOADING MACHINES

Hermann Kumpf, Dusseldorf-Eller, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Oct. 2, 1968, Ser. No. 764,526
Int. Cl. B66c *1/10*
U.S. Cl. 294—86 **7 Claims**

Centering device in a machine for loading fuel elements in a nuclear reactor having a movable vertical tubular loading mast and a fuel element clamping device movable in the mast interior includes a tubular member located at and telescoping the lower end of the mast and being displaceable in the longitudinal direction thereof so as to telescope a fuel element selected from a multiplicity of fuel elements forming a reactor core. The tubular member has a lower edge portion

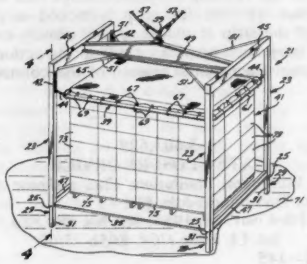


formed with a surface engageable with the fuel elements of the reactor core located adjacent the selected fuel element so as to align the latter with the mast.

3,603,635
LOAD HOLDING APPARATUS

Allan R. Ide, Cyprus, Calif., assignor to Metropolitan Stevedore Company, Wilmington, Calif.

Filed June 8, 1970, Ser. No. 44,367
Int. Cl. B66c *1/16*
U.S. Cl. 294—67 D **8 Claims**



Load holding apparatus including a cargo cage having a floor, the underside of which defines the support base for the cage. The cage includes a plurality of hollow vertical posts which are open on their bottom extremities and have support rods telescoped upwardly thereinto, the lower extremities thereof projecting below the floor when the cage is suspended. A holder is disposed over the cage floor and is suspended at its periphery from the upper ends of the respective support rods whereby the lower extremities of the support rods will engage a support surface onto which the cage is lowered and will be telescoped upwardly in the respective posts to raise the holder off cargo carried on the cage floor for convenient removal of such cargo and when other cargo has been loaded on the floor and the cage is raised, the rods will drop downwardly in the respective posts to lower the holder onto the top of such cargo to hold it in securely on the floor while the cage is manipulated about.

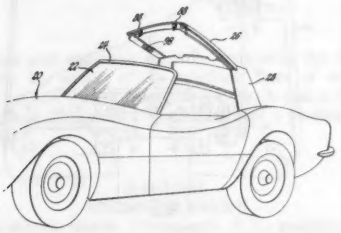
3,603,636
MOUNTING ARRANGEMENT FOR A VEHICLE BODY ROOF PANEL

Richard F. Carella, Mt. Clemens, and James J. Johnson, Detroit, both of, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 24, 1970, Ser. No. 13,499
Int. Cl. B60j *7/10*
U.S. Cl. 296—137 B **4 Claims**

A mounting arrangement for a vehicle body roof panel for closing a roof opening in a vehicle body. A pair of hinge as-

semblies pivotally support the roof panel on the body for movement between open and closed positions. Each hinge assembly includes a body mounted hinge member and a panel mounted hinge member which are locked to each other by a ball detent when the roof panel is in the closed position. When the roof panel is in the open position, each panel mounted hinge member is detachable from its respective body mounted hinge member and the roof panel is thus removable from the vehicle. A pair of latch assemblies include latch members pivotally supported on the roof panel for movement between latching positions and unlatching positions. When the latch members are in the latching positions, they are engageable with respective body mounted pins to retain the roof panel in the closed position. When the latch members are in the unlatching positions, the roof panel is free to move between the open and closed positions. The latch members are associated with respective sleeve detents movable between locking positions and unlocking positions. In the locking positions, the sleeve detents lock the latch members in the latching positions. A pair of release levers



are pivotally supported on the roof panel and each is connected by a Bowden cable to each of the sleeve detents. Actuation of either of the release levers moves the sleeve detents to the unlocking positions. The latch members are also associated with respective pin detents located within the sleeve detents and movable between locking positions and unlocking positions. When the sleeve detents are in the unlocking positions and the pin detents are in the locking positions, the pin detents lock the latch members in the latching positions. A pair of solenoids are mounted on the roof panel and respectively connected to the pin detents to move the pin detents from the locking positions to the unlocking positions. The solenoids are responsive to actuation of either of the release levers and to the position of a transmission selector lever such that actuation of either of the release levers when the transmission selector lever is in a "park" position causes the solenoids to move the pin detents to the unlocking positions. When the sleeve detents and the pin detents are in the unlocking positions, the latch members are free to move to the unlatching positions and the roof panel is free to move between the open and closed positions.

3,603,637

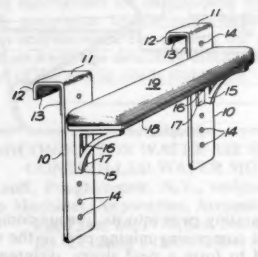
ADJUSTABLE ARM REST FOR AUTOMOBILES

Joe A. DePinto, Box 354, New Bedford, Pa.

Filed Jan. 6, 1969, Ser. No. 789,145

Int. Cl. B60j *9/00*

U.S. Cl. 296—153 **2 Claims**



An adjustable arm rest including hanger brackets engageable in the window openings of an automobile door and an elongated horizontal arm support portion adjustably secured thereto.

3,603,638

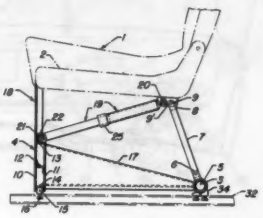
VEHICLE SEAT SUPPORT STRUCTURE

Eugene R. McGregor, Huntington Beach, Calif., and Alex I. Koji, Washington, Conn., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 716,173, Mar. 26, 1968, now abandoned. This application Feb. 17, 1969, Ser. No. 799,668

Int. Cl. F16m *11/00*

U.S. Cl. 297—216 **10 Claims**



A seat-supporting structure particularly adapted for aircraft which provides transverse front and rear beam members for attachment to the vehicle floor; a maximum of individual open luggage storage space under the superposed seat and, at the same time, provides for individual forward and down seat movement against the slowly yielding action of a deformable front panel section which works in combination with energy-absorbing means.

3,603,639

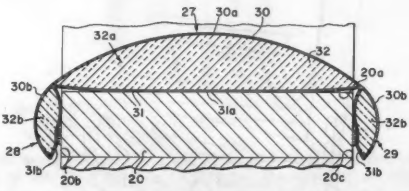
DETACHABLE SEAT PAD FOR SNOWMOBILES AND THE LIKE

Betty A. Wilson, 5240 E. Pickard, Mount Pleasant, Mich.

Filed May 19, 1969, Ser. No. 825,486

Int. Cl. A47c *31/02*

U.S. Cl. 297—219 **10 Claims**



A detachable seat pad for use on the seat of a snowmobile and the like including an upper portion adapted to overlie the top of the snowmobile seat and side portions adapted to extend along opposite sides of the seat. Nonadhesive means is provided for releasably securing the side portions to the side of the seat and preferably includes confronting bristles having free ends provided with interengageable hooks.

3,603,640

CHAIR CONTROL WITH TORSION SPRING WITH TILTING SEAT AND CHAIR BACK

Joseph T. Doerner, Waterloo, Ontario, Canada, assignor to Doerner Products Co., Limited, Waterloo, Ontario, Canada

Filed Nov. 26, 1969, Ser. No. 870,318

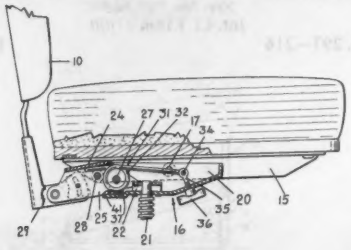
Claims priority, application Canada, Sept. 23, 1969, 062732

Int. Cl. A47c *3/00;* **B60n** *1/02*

U.S. Cl. 297—292 **3 Claims**

A chair control for tilting and posture wherein the control has a first frame member and a second frame member

pivotally attached together by a first pivot. The first frame member is mountable on the top end of the chair post which is carried by the chair base. The first frame member is pivotally connected, by a second pivot, to a seat-support member, adjacent the front end thereof allowing the support member to have pivotal movement. The second frame member, in addition to being pivotally connected to the first frame is also pivotally connected to the seat-support member, adjacent the rear portion, by a third pivot. A coiled



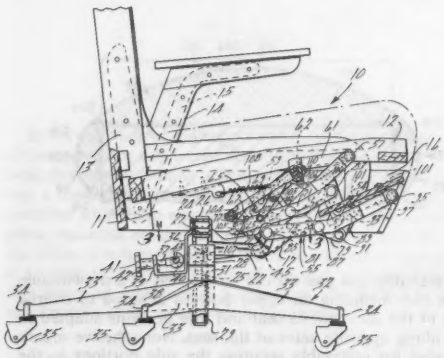
torsion spring biases the second frame against movement from and return to a normal position to permit pivotal movement of the second frame relative to the first frame. A chair seat is pivotally fastened to the first frame for limited up and down tilting on its pivot. The chair back is mounted in an upright position to the second frame for limited backward movement against the tension of the torsion spring. When the chair back is tilted backward the seat is caused to pivot so that the seat will be tilted downwardly toward the back to a slight extent.

3,603,641

OFFICE-TYPE CHAIR

Edward M. Knabusch, and Edwin J. Shoemaker, both of Monroe, Mich., assignors to La-Z-Boy Chair Company

Filed Sept. 12, 1969, Ser. No. 857,406
Int. Cl. A47c *3/00*
U.S. Cl. 297—300 **9 Claims**



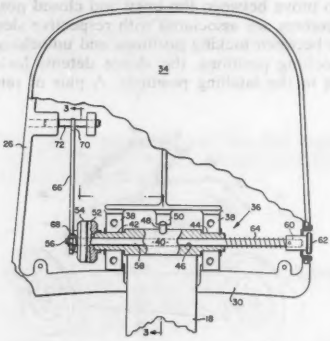
The base frame of the chair is pivoted to arms on a cross-member having a central downwardly extending stud with a nut thereon. The lower end of the stud has a sleeve of nylon which forms a bearing with a hub of the base which has supporting feet extending therefrom on the ends of which casters are provided. The base frame has a bracket on each side to which the ends of a U-shaped bar is pivotally secured for forward movement when the base frame is tilted with the seat and back frames fixed or movable relative thereto. The central part of the bar is secured in a hook having a hand nut thereon by which tension is provided to the bar to have it preloaded to conform to the weight of the person occupying the chair. Upon the backward tilting of the base frame the bar will bend from the center to thereby resist the tilting movement. A leg rest and mechanism therefor is secured to the fixed or movable seat frame in position to have the leg rest extend forwardly thereof when in use.

3,603,642

ARTICULATED HEADREST FOR DENTAL CHAIRS AND THE LIKE

Fritz B. Laessker, Fairport, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Oct. 13, 1969, Ser. No. 865,796
Int. Cl. A47c *1/10*
U.S. Cl. 297—408 **5 Claims**



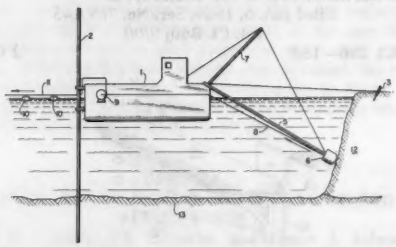
Disclosed is an articulated headrest for dental chairs in which the mechanism for locking the headrest in position is wholly contained within the headrest. The lock mechanism includes a pair of engageable toothed clutch members, one fixed to the headrest support and one to the headrest, and a lever arm fixed at one end to the latter clutch member and slidably connect at its other end to the headrest. The lever arm permits axial movement of the clutch member fixed to the headrest for disengaging the lock and setting the headrest in the desired position and increases the stability of the headrest.

3,603,643

METHOD OF SEPARATING PEAT INTO FIBROUS SUBSTANCE AND HUMIC SUBSTANCE

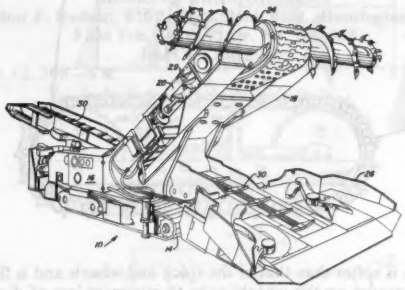
Masao Hirota, Sunagawa, Hokkaido; Kazumi Nakarai, Sunagawa, Hokkaido; Kenji Io, Sunagawa, Hokkaido; Keiji Tanaka, Sunagawa, Hokkaido, and Katsuji Matsuda, Tokyo, all of, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Aug. 8, 1969, Ser. No. 848,522
Claims priority, application Japan, Dec. 30, 1968, 43/96540
Int. Cl. E21c *49/00*
U.S. Cl. 299—9 **2 Claims**



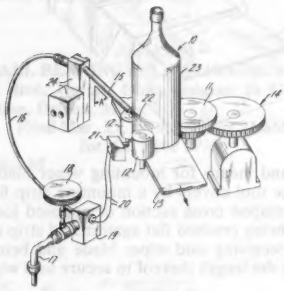
Method of separating peat into its fibrous component and humic component comprising mining peat in the water existing in a peat bed to form a peat slurry, disintegrating it to suspend the fibrous component and humic component in the water, and separating the fibrous component from the humic component suspended in the water.

3,603,644
MINING VENTILATION APPARATUS AND METHOD
Harold C. McCleery, R.D. #1, Franklin, Pa.
Filed Apr. 15, 1969, Ser. No. 816,224
Int. Cl. E21c *35/22*
U.S. Cl. 299—12 12 Claims



A method and apparatus for fully ventilating the face of a mined area by means of an auxiliary flow of air which deflects a normal flow of ventilating air such that a relatively greater area of a mine face is contacted by a passing flow of ventilating air.

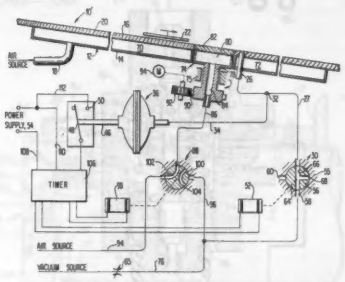
3,603,645
AIR SPEED ASSIST
Donald Frederick Hardy, Horseheads, N.Y., assignor to Dart Industries, Inc., Los Angeles, Calif.
Filed Aug. 1, 1969, Ser. No. 846,747
Int. Cl. B65g *47/26*
U.S. Cl. 302—2 5 Claims



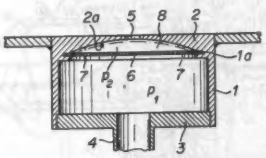
A process and apparatus for assisting the motion of an article such as a bottle on a conveyor. The process comprises detecting when the article needs assistance and at that time directing an airstream at the article at an angle which will assist the article motion. The apparatus comprises an airstream directed at the article which will move the article in the direction of motion of the conveyor, a nozzle for directing the airstream, a valve for controlling the airstream, a detecting mechanism for determining when the bottle motion needs assistance and a relay between the detecting mechanism and the valve for opening the valve to permit the passage of air when the detecting mechanism determines that the motion of the article needs assistance.

3,603,646
SEMICONDUCTOR WAFER AIR SLIDE WITH CONTROLLED WAFER MOTION
Arkady Leoff, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 26, 1970, Ser. No. 5,454
Int. Cl. B65g *51/02, 53/04, 53/20*
U.S. Cl. 302—29 10 Claims

A gravity-type air slide is provided with a series of spaced vacuum holds with a differential vacuum switch in the vacuum supply circuit allowing self-controlled feed of wafers sequentially from one vacuum hold to another along the slide. An inspection station comprising a revolving pedestal with a porous support surface may be placed adjacent to one of the vacuum holes and coupled selectively to positive air pressure or to vacuum pressure by a switch over valve which is also controlled by the differential vacuum switch. The wafer becomes part of the revolving pedestal and inspection is performed on it. Afterwards, the wafer is released from the pedestal and continues along the air slide path by gravity.



3,603,647
PRESSURE-RESPONSIVE AIR DISCHARGE DEVICES
Shimon Arieh, Geneva, and Georges Revillet, Petit-Lancy/Geneva, both of, Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland
Filed Apr. 30, 1969, Ser. No. 820,360
Claims priority, application Switzerland, May 2, 1968, July 3, 1968, 6621;9923
Int. Cl. B65g *53/04*
U.S. Cl. 302—29 9 Claims

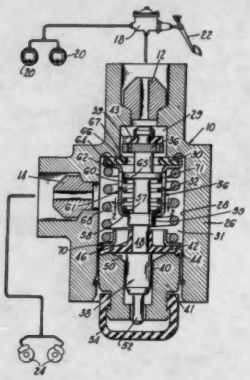


A device for forming, in conjunction with similar devices, a layer of air on a surface to provide support for an object, comprises a casing divided by a flexible, tensioned, membrane into two compartments communicating respectively with a supply of compressed air and a discharge opening. The membrane, which lies near this opening, is normally deformed into contact therewith to close it off but will move away therefrom upon a fluid pressure being exerted on the membrane from the opening side to allow compressed air to flow through the opening via ports formed near the periphery of the membrane.

3,603,648
DOUBLE-ACTING SEAL FOR METERING VALVE
Raymond A. Reznicek; Gerald L. Kretchman, and Samuel E. Stone, all of St. Joseph, Mich., assignors to The Bendix Corporation
Filed Sept. 8, 1969, Ser. No. 855,960
Int. Cl. B60t *11/34, 8/26*
U.S. Cl. 303—6 C 2 Claims

A metering valve is interposed between the master cylinder and the disc brakes of a braking system employing both disc and drum brakes. The valve permits fluid communication

between the master cylinder and the disc brakes until a first predetermined level of pressure is reached whereupon the



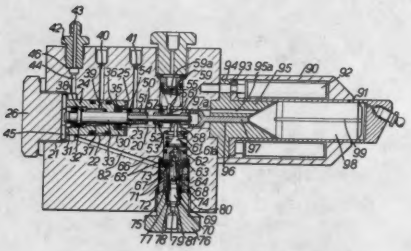
fluid communication is terminated until a still higher lever of fluid pressure is achieved, whereupon the valve is fully open.

3,603,649

HYDRAULIC BRAKING SYSTEMS FOR VEHICLES

Alexander J. Wilson, Warwickshire, England, assignor to Girling Limited, Tyseley, England

Filed Sept. 11, 1969, Ser. No. 856,982
Claims priority, application Great Britain, Sept. 11, 1968, 43124/68
Int. Cl. B60t *8/12, 13/14*
U.S. Cl. 303—21 F **19 Claims**



A control unit for a vehicle-braking system comprises a housing incorporating a bore in which works a piston or plunger which, when subjected at one end to fluid pressure from a master cylinder, is movable in the bore in one direction to close a first valve controlling communication between the bore and a return line to the high-pressure source and open a second valve to permit high-pressure fluid from a high-pressure source to pass to a slave cylinder of a wheel brake through an outlet connection in the housing. The unit also incorporates an antiskid device operative to move the piston or plunger in a reverse direction to close the second valve and open the first valve when the deceleration of the braked wheel exceeds a predetermined value.

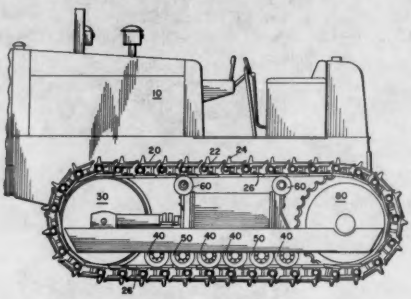
3,603,650

WHEEL LINERS FOR TRACK-TYPE VEHICLE

Robert L. Miller, 1320 K St., Anchorage, Alaska

Filed Feb. 18, 1969, Ser. No. 800,093
Int. Cl. B62d *55/14*
U.S. Cl. 305—25 **8 Claims**

An abrasion preventing liner for the track engaging surface of the wheels and rollers of an endless track-type vehicle, such as used in earthmoving, is provided to extend the useful life of the endless track. The liners are made of a material



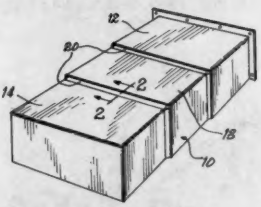
which is softer than that of the track and wheels and is fitted into grooves on the wheels so as to minimize loss of dimensional stability.

3,603,651

MEANS FOR MOUNTING WIPER BLADES ON TELESCOPIC MACHINE TOOL COVERS

Charles H. Weber, Mayville, Wis., assignor to Maysteel Products Corp., Milwaukee, Wis.

Filed Apr. 17, 1969, Ser. No. 816,888
Int. Cl. F16c *29/00;* **F16j** *13/00*
U.S. Cl. 308—3.5 **5 Claims**



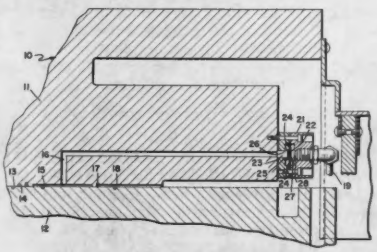
A method and means for mounting wiper blades on telescopic machine tool covers by a mounting strip formed with a generally S-shaped cross section of opposed loops, the innermost loop being crushed flat against said strip and the outermost loop receiving said wiper blade and being clamped together along the length thereof to secure said wiper blade.

3,603,652

SLIDE BEARINGS FOR MACHINE TOOL WAY

David H. Youden, Worcester, Mass., assignor to The Heald Machine Company, Worcester, Mass.

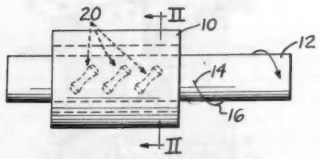
Filed Mar. 5, 1969, Ser. No. 804,580
Int. Cl. F16c *17/04;* **F16n** *1/00*
U.S. Cl. 308—5 **3 Claims**



This invention relates to a machine tool way, and more particularly, to apparatus providing the bearing system

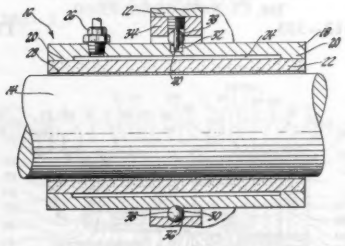
between relatively sliding parts of a machine tool, wherein the way surfaces are maintained in parallel, spaced relationship by pressure fluid.

3,603,653
BEARING ARRANGEMENT
Arthur F. Hudson, 610 Indiana Bank Bldg., Huntington, Ind.
Filed Feb. 5, 1969, Ser. No. 796,865
Int. Cl. F16c *29/06*
U.S. Cl. 308—6 R **5 Claims**



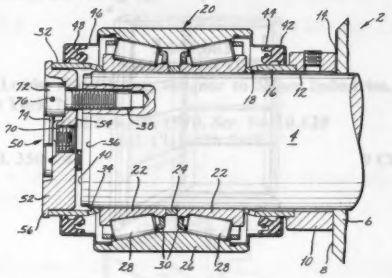
The present invention is concerned with a bearing arrangement in which contoured rollers are introduced into the space between concentric members. The rollers are disposed at an angle to the axis of the members and are contoured so as to have large ends rollingly engaging the inside surface of the outer member and reduced diameter central portions which rollingly engage the outer surface of the inner member. The rollers cause the members to rotate relatively while relatively reciprocating.

3,603,654
BALL BEARING SELF-ALIGNING SEAT
Melvyn R. Bird, Huron, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 23, 1970, Ser. No. 21,655
Int. Cl. F16c *21/00*
U.S. Cl. 308—35 **2 Claims**



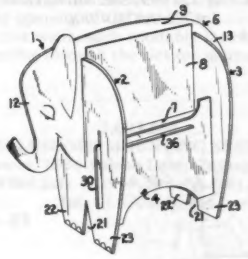
An externally pressurized gas bearing of the porous sleeve type is used to rotatably support one end of a rotor on an electric motor. The gas bearing housing in turn is mounted on a ball bearing having limited radial play and ball raceways of open curvature thus giving a limited self-alignment to the gas bearing. The ball bearing is normally inoperative due to an interposed frangible link, however, should the gas supply be interrupted during the operation of the motor, seizure of the rotor is prevented by a breaking of the link and rotation of the ball bearing.

3,603,655
BEARING ASSEMBLY
Thomas C. Keller, Canton, and Louis H. Gegenheimer, Lakewood, both of, Ohio, assignors to The Timken Company, Canton, Ohio
Filed Oct. 1, 1969, Ser. No. 862,801
Int. Cl. F16c *13/02*
U.S. Cl. 308—180 **4 Claims**



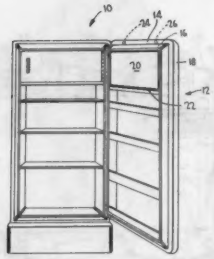
A bearing assembly has an end cap which is recessed into the outboard wear ring thereof so that the axial projection on the end cap is minimized.

3,603,656
ARTICLE OF FURNITURE
Nathan B. Ferman, 13207 Ashland, Grandview, Mo.
Filed Oct. 16, 1969, Ser. No. 866,902
Int. Cl. A47b *17/00, 97/04;* **A47c** *7/00*
U.S. Cl. 312—195 **6 Claims**



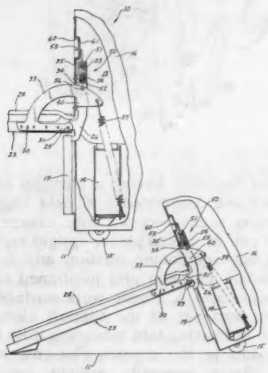
An article of furniture having a plurality of interlocking elements which are assembled and held together without separate fasteners, such as screws, bolts, clamps, pins and the like includes a pair of spaced planar upright support elements positioned in opposed facing relation and a planar brace member extending between and positioned normal to the support elements and a planar work surface having side edges engaging surfaces of the support elements and the brace member and having tabs extending from the side edges and through slots in the support elements and the brace member. A planar generally upright partition extends between and interlocks with the support elements and has a lower edge engaging an upper surface of the work surface and a tab extending from the lower edge and through a slot in the work surface. The brace member has end edges engaging facing surfaces of the support elements and tabs extending from the end edges and through slots in the support elements and at least one of the tabs has a lock tab extending therefrom and positioned to engage an exterior surface of a respective support element. Each of the slots have facing side surfaces positioned to engage opposite side surfaces of the respective tab extending therethrough.

3,603,657
REFRIGERATED SAFETY CABINET
William F. Hassay, 1613 Grunther Ave., Rockville, Md.
Filed Mar. 4, 1969, Ser. No. 804,177
Int. Cl. A47f *3/00*; F25d *11/00*; A47b *81/00*
U.S. Cl. 312—214 7 Claims



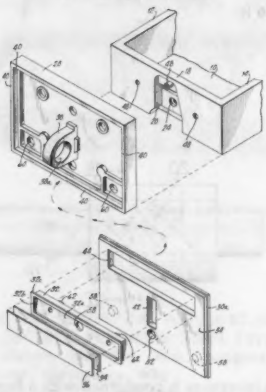
A refrigerator having a safety latch medicine compartment integral with the refrigerator door is described. The door latch of the medicine compartment is invisible and integral with the refrigerator door, e.g., below the door seal, and actuated only by touching or pressing one or more predetermined spots on the door. A medicine compartment is provided for normal household use which will maintain drugs at storage temperatures without constituting a hazard to children and/or inattentive adults.

3,603,658
LATCH FOR DISHWASHER DOOR
Richard P. Bergeson, Lambs Grove, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa
Filed May 1, 1969, Ser. No. 821,046
Int. Cl. A47b *49/00*
U.S. Cl. 312—319 7 Claims



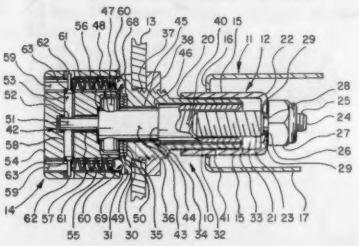
A latch is operable for positively locking a front-opening, bottom-hinged dishwasher door in an open substantially horizontal position to prevent an upsetting of the appliance when an overload is applied to the open door. The door is locked relative to the cabinet so that the engagement of the door with the floor, after a small amount of tipping of the dishwasher, will prevent further tipping.

3,603,659
DRAWER HEAD FOR INDEX CARD FILE DRAWERS
Murray Rothenberg, Pottstown, and Donald A. Richardson, Krausedale, both of, Pa., assignors to Art Metal-Knoll Corporation, New York, N.Y.
Filed June 17, 1970, Ser. No. 47,027
Int. Cl. A47b *88/00*
U.S. Cl. 312—330 9 Claims



A file drawer, such as an index card drawer of rectangular cross section, having a composite drawer head comprising: a frame plate which attaches to the front wall of the drawer and has (1) a forward projection serving as a drawer pull hook and (2) a marginal forwardly projecting flange; a cover plate which fits tightly within the marginal flange of the frame plate and has an aperture allowing the hook to pass through; and a label frame which fits tightly in an aperture in the insert plate. The label frame is adapted to receive a label and has at least one pair of facing grooves for holding edges of the label. The label, or a label cover, or both, may be resilient and slightly larger than the label frame opening for the purpose of being retained in said grooves in resilient fit.

3,603,660
BOX HOLDDOWN DEVICE
Marvin D. Weltha, Marion, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa
Filed May 15, 1970, Ser. No. 37,608
Int. Cl. A47b *88/00*, *95/00*
U.S. Cl. 312—333 17 Claims



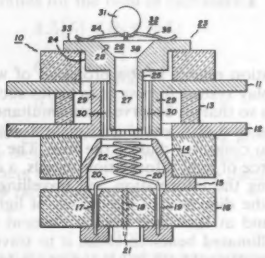
A turn detent lock holddown device for insertion and extraction forcing and guidance of equipment boxes on electronic racks with a fast lead screw and guided dowelling between box and rack mounted device portions and with a ball detent lock for static box in place locking. Further, with a two holddown device equipped box dowell restrainment through one holddown device in all lateral directions and dowell restrainment through the other holddown device only

from movement laterally back and forth in the direction that would otherwise permit rotational movement of the box about the longitudinal axis of the device with dowell restrainment in all lateral directions.

3,603,661
VACUUM SEAL

Richard Gray Detro, Scotia, N.Y., assignor to General Electric Company

Division of Ser. No. 426,893, Jan. 21, 1965, abandoned
Filed Sept. 20, 1968, Ser. No. 766,367
Int. Cl. H01j 9/00
U.S. Cl. 316—17 **6 Claims**

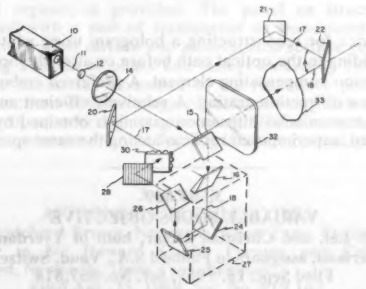


The disclosure provides a method for evacuating and sealing an apparatus such as, for example, a voltage-tunable magnetron device, by providing a large evacuation aperture with a sealing ball spaced above the aperture by a support member comprising solder material. The support member spaces the seal ball away from the aperture enabling one to adequately evacuate the device. After sufficient evacuation the temperature is raised to melt the support and allow the seal ball to close and seal the aperture. The melting support structure provides the solder to seal the ball to the walls of the aperture.

3,603,662
TWO-BEAM, WIDE-VIEWING ANGLE HOLOGRAPHIC APPARATUS

Ralph F. Wuerker, Palos Verdes Estates, and Lee O. Heflinger, Torrance, both of, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 29, 1969, Ser. No. 888,459
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 **4 Claims**



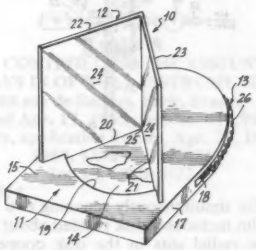
Holographic apparatus for taking holograms in transmission with lasers of limited coherence permitting a wide-viewing angle on the order 50° to 60°. The apparatus features an angle between the reference and scene beams, at the hologram, on the order of 90°. Once the laser beam is enlarged and collimated there is no need for any additional lenses in the path of the reference beam. The scene beam includes a diffuser and a lens system between the light diffuser and the object being holographed. The lens collects light diffused by the light diffuser, focusing it through the object onto the hologram and provides the wide three-dimensional viewing angle for reproduction. Also a beam bender is included into the path of the scene beam for bending the light through an angle of 90° and deliberately introducing path length differences across the cross section of the scene beam.

This invention herein described was made in the course of or under a contract or subcontract thereunder, with the Department of the Air Force.

3,603,663
KALEIDOSCOPE

Peter Lewis, Hong Kong, assignor to Miner Industries, Inc., New York, N.Y.

Filed Feb. 10, 1970, Ser. No. 10,129
Int. Cl. G02b 7/08
U.S. Cl. 350—4 **9 Claims**

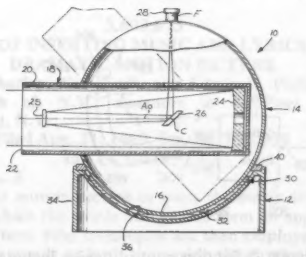


A kaleidoscope having a hollow base with a slot along a portion of its periphery and a pair of upstanding reflective walls extending fixedly along the radial edges of a sector-shaped opening in the top of the base, and a disk movable into and out of the hollow base through its peripheral slot and being rotatably located when within the base to expose designs at the opening of the latter for kaleidoscopic display by the reflective walls, such rotatably located disk having its margin projecting through the slot for manual rotation of the disk.

3,603,664
TELESCOPE MOUNTING SYSTEM

Norman J. James, 7354 Valaho Lane, Tujunga, Calif.

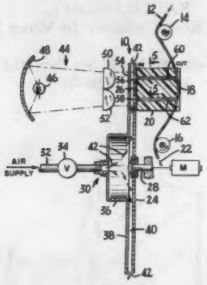
Filed July 1, 1968, Ser. No. 741,455
Int. Cl. G02b 23/16
U.S. Cl. 350—83 **8 Claims**



A telescope mount is provided having a supporting base and a generally spherical telescope housing swiveled in the base. The supporting base has an upwardly opening basin receiving the lower portion of the telescope housing and containing a fluid-bearing medium in which the housing floats. The mount is equipped with means for rotating the telescope housing in a tracking mode about an inclined polar axis passing through the center of the housing parallel to the

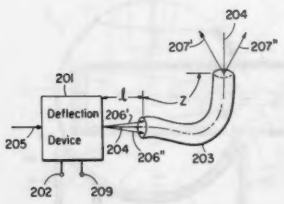
earth's axis of rotation and independently rotating the housing in an elevating mode about a horizontal declination axis extending through the center of the housing normal to the polar axis.

3,603,665
FIBER OPTICS DISK SCANNING SYSTEMS
Peter C. Goldmark, Stamford, and John W. Christensen, New Canaan, both of, Conn., assignors to Columbia Broadcasting System Inc.
Filed Nov. 26, 1968, Ser. No. 779,196
Int. Cl. G02b *5/16*
U.S. Cl. 350—96 B **8 Claims**



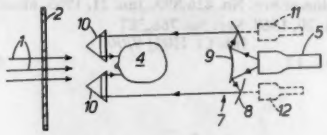
Apparatus for simultaneously scanning two related frames of color TV film includes a disk rotated about its axis at high speed. Narrow radial slits in the disk cooperate with two separate fiber optics channels each formed with an entrance and a narrow exit. A lamp lights the disk, and the disk slits and exits are relatively oriented so that a scanning spot emanates from each exit and executes a rectilinear scan, notwithstanding curvilinear motion of the disk slits as the disk is rotated. Moreover, the fiber optics channels are tapered if necessary so that the scanning lines are of disk length, whether or not the disk slits are all at the same radial location.

3,603,666
LIGHT BEAM DEFLECTION CONTROL DEVICE WITH GRADIENT INDEX LIGHT GUIDE
Teiji Uchida, and Mitsuhito Sakaguchi, both of Tokyo, Japan, assignors to Nippon Selfoc Company, Limited c/o Nippon Electric Company, Ltd., Tokyo, Japan
Filed July 3, 1969, Ser. No. 838,870
Claims priority, application Japan, July 6, 1968, 43/46963 43/46964
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 R **1 Claim**



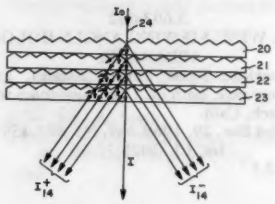
A light beam deflection control device includes an elastic fibrous converging light guide having a refractive index greatest along the guide axis. The guide is disposed in a predetermined configuration having an incident light end face and an emitting light end. Axially disposed adjacent the incident end face, but longitudinally removed, are means for slightly deflecting a coherent light beam whereby the position from the guide axis on the incident face and the angle of incidence are converted into an amplified angle of emission from the emitting light end.

3,603,667
HEAD-UP DISPLAYS
Michael H. Freeman, Denbigh Court, England, assignor to Pilkington Perkin-Elmer Limited, Liverpool, England
Filed June 24, 1969, Ser. No. 836,042
Claims priority, application Great Britain, June, 1968, 31226/68
Int. Cl. G02b *5/12*
U.S. Cl. 350—103 **11 Claims**



This invention relates to the provision of what is called a head-up display system for use in vehicles such as aircraft or land vehicles so that an observer can simultaneously view the outside scene and also visual information without having to look down to consult a dial or the like. The new system includes a source of light information signals, a collimated light beam carrying the information and travelling in a direction opposite to the direction of movement of light from an outside scene and at least one optical element to reflect light from the collimated beam to cause it to travel along a path parallel to its original path but in the opposite direction so as to superimpose an image of the light information signals on the field of view of the observer.

3,603,668
COMPOSITE DIFFRACTION GRATING FORMED FROM SUPERIMPOSED ALIGNED GRATINGS
Dominick John DeBitetto, Briarcliff Manor, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.
Division of Ser. No. 599,241, Dec. 5, 1966. Filed Jan. 29, 1970, Ser. No. 879,976
Int. Cl. G02b *5/18, 27/38*
U.S. Cl. 350—162 R **2 Claims**

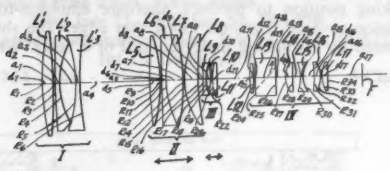


A device for reconstructing a hologram using white light, by providing in the optical path before or after the hologram a dispersion-compensating element. A preferred embodiment employs a diffraction grating. A relatively efficient and inexpensive transmission diffraction grating is obtained by a pile of aligned, superimposed replicas having the same spacing.

3,603,669
VARIABLE FOCUS OBJECTIVE
Kow-Fat Lai, and Christian Lietar, both of Yverdon Vaud, Switzerland, assignors to Paillard S.A., Vaud, Switzerland
Filed Sept. 15, 1969, Ser. No. 857,814
Claims priority, application Switzerland, Oct. 10, 1968, 15136/68
Int. Cl. G02b *15/16, 9/34*
U.S. Cl. 350—186 **6 Claims**

A variable-focus objective comprises in order starting from the front, a first divergent fixed-focusing group, two movable groups, one convergent and the other divergent, said two movable groups filling the role of variator and compensator

at the same time, and a fixed convergent rear group, said first group comprising at least three lenses of which the first is a



convergent lens, the others being divergent, and of the following limiting ratios for the radii of curvature:

$$1.5|f_1| \leq R_1 \leq 6|f_1|$$

$$0 \leq \left|\frac{1}{R_3} - \frac{1}{R_2}\right| \leq \left|\frac{1}{f_1}\right|$$

$$0.5|R_6| \leq |R_5| \leq 4|R_6|$$

where f_1 is the focal distance of the focusing group. The first fixed group may include 3 or 4 lenses of which one is convergent and the others divergent. The focusing distance is $2f_1$ to $3f_1$ and the zoom ratio is about 5.

3,603,670

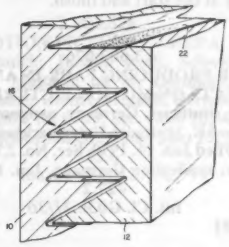
DIRECTIONAL PANEL ADAPTED TO CONTROL THE PASSAGE OF INCIDENT RADIATION

Sangbong Kim, 422 S. Mansfield Ave., Los Angeles, Calif.

Filed Dec. 29, 1969, Ser. No. 888,463

Int. Cl. G02b *17/00*

U.S. Cl. 350—260 **9 Claims**



A directionally transmissive optical panel or structure, which is adapted to control the passage therethrough of incident electromagnetic radiation in the visible and invisible spectral regions, is provided. The panel or structure is fabricated with a pair of transparent or translucent plates each having a flat surface and a corrugated surface generally including a series of peaks and valleys extending along the width or horizontal dimension of the respective plates, alternate sections of the corrugated surfaces being fashioned to have an opaque or reflective coating. The corrugated surfaces are maintained in interlocking intimate optical contact.

3,603,671

ASTRONOMICAL TELESCOPES

David Scatcherd Brown, Newcastle, Upon Tyne, England, assignor to Sir Howard Grubb Parsons and Company Limited, Newcastle, Upon Tyne, England

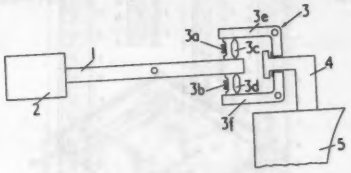
Filed Apr. 25, 1969, Ser. No. 819,162

Claims priority, application Great Britain, May 1, 1968, 20557/68

Int. Cl. G02b *5/08*

U.S. Cl. 350—310 **4 Claims**

Means for correcting astigmatic distortion produced by changes in orientation of an astronomical telescope mirror, which means comprise a series of devices for applying forces acting in a direction parallel to the optical axis of the mirror in the region of the mirror outer edge which forces increase with increase in the zenith angle and have a sense and a distribution around the mirror edge so as to oppose the said distortion.



3,603,672

DEVICE FOR CONTROLLING THE AMOUNT OF LIGHT RAYS IN OPTICAL INSTRUMENTS

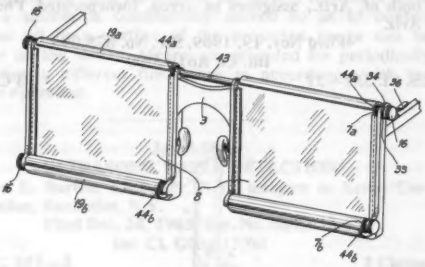
Paul Bastide, 108 rue de Rennes, Paris, France

Filed Apr. 17, 1969, Ser. No. 816,994

Claims priority, application France, Apr. 29, 1968, Mar. 5, 1969, 149875;6906054

Int. Cl. G02b *5/22*

U.S. Cl. 350—314 **11 Claims**



The amount or intensity of light rays passing through a lens or transparent sheet, or reflected by a mirror is controlled by winding a film over the lens or mirror, the film having portions throughout its length having different degrees of opacity or different colors.

3,603,673

METHOD OF INSERTING MUSIC AND LYRICS INTO A DRAMATIC MOTION PICTURE

Morris I. Charlap, New York, and Edwin H. Picker, Riverdale, both of, N.Y., assignors to E. Paul Charlap, Larchmont, N.Y.

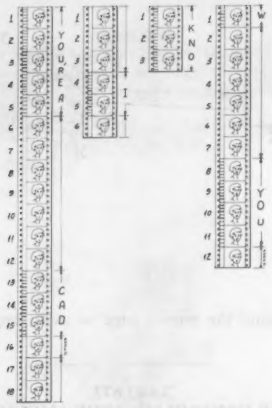
Filed Aug. 21, 1969, Ser. No. 852,039

Int. Cl. G03b *31/02*

U.S. Cl. 352—5 **6 Claims**

A dramatic motion picture or parts thereof is divided into sections in which the words and pauses form an approximate rhythmic pattern. Film techniques are then employed to alter the pauses or words or both to provide the rhythmic pattern with a convenient common denominator of a comparatively low number which can serve as a common denominator for the time signature of a musical composition. A musical composition is then composed with an appropriate time signature to provide an easy or listenable rhythm using the common denominator thus achieved. The composition is provided with lyrics and an accompaniment in synchronism with the rhythm built into the film by film-editing techniques. A new soundtrack is photographed with the artists performing the

musical composition at a tempo corresponding to the tempo at which the film is to be shown. A composite print is then



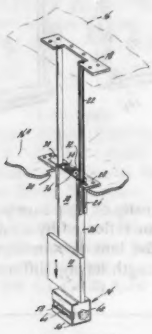
made of the action and the words and music which will appear in synchronism with the lip movements and action of the dramatic motion picture.

3,603,674

EYE-TESTING SYSTEM AND APPARATUS

John C. Abromavage, Tempe, and James F. George, Phoenix, both of, Ariz., assignors to Arcoa, Incorporated, Phoenix, Ariz.

Filed Nov. 19, 1969, Ser. No. 878,095
Int. Cl. A61b *3/00*
U.S. Cl. 351—37 **3 Claims**



An eye test visual combination for vertically and horizontally positioning charts, screens and the like for stereoscopic vision testing, visual field testing and close reading testing. A system consisting preferably of an electrohydraulic device is used for the positioning of the charts and screens in combination with a frame and adjustable track system and selectively operable multiple display charts to effect different tests.

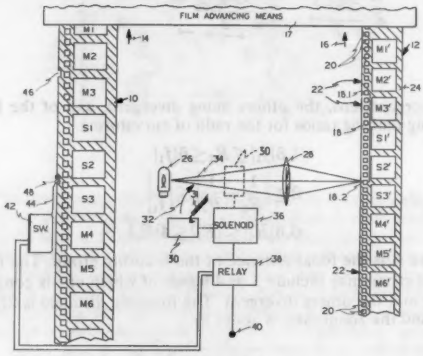
3,603,675

MOTION PICTURE FILM REPRODUCING APPARATUS AND METHOD WITH PROVISION FOR TRANSLATION OF STOP-MOTION CODING

Charles Woodruff, deceased, late of New York, N.Y. (by Ethel Woodruff, executrix), assignor to Visual Instruction Systems Inc., New York, N.Y.

Filed July 28, 1969, Ser. No. 846,997
Int. Cl. G03b *21/52, 27/52*
U.S. Cl. 352—56 **9 Claims**

A copy of a motion picture film is prepared and provided with stop-motion coding in the form of a strip along the sprocket edge which includes emulsion-free segments. To accomplish this, an auxiliary light source is focused on the sprocket edge, and a shutter is moved into and out of blocking position to produce alternate emulsion-free and emulsion-covered segments along that edge. The shutter is operated by a solenoid under control of a relay. When the



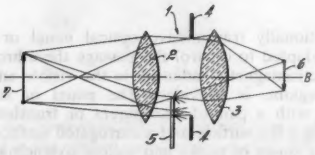
copy film is reproduced from a master film having stop-motion indicia in the form of successive notches indicating the start and finish respectively of a stop-motion segment, the relay embodies a push-push type of movement and is under the control of a microswitch which senses the notches and pulses the relay at the start and finish.

3,603,676

MEANS FOR PRODUCING FADE-IN AND FADEOUT EFFECTS ON MOTION PICTURE FILM

Richard Loewe, Stuttgart, Germany, assignor to Robert Bosch Photokino GmbH, Stuttgart-Unterluerkheim, Germany

Filed Jan. 14, 1970, Ser. No. 2,790
Claims priority, application Germany, Jan. 18, 1969, P 19 02 427.2
Int. Cl. G03b *21/36*
U.S. Cl. 352—91 **11 Claims**



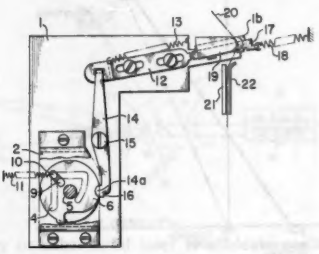
A motion picture camera with a between-the-lens diaphragm wherein the means for producing fade-in and fadeout effects comprises a diaphanous light-dispersing optical element which is movable across the path of incoming scene light between the diaphragm and one lens of the picture-taking objective so that the optical element thereby varies the sharpness of the real image which is produced by the objective. The optical element is movable by a rotary cam against the opposition of a spring and its initial position with reference to the aperture of the diaphragm is adjustable by a selector which can pivot a lever positioned to displace the optical element in response to rotation of the cam or in response to displacement of the selector. A carrier which supports the optical element and is movable by the lever is provided with a mask which can be moved across the path of incoming scene light instead of the optical element to thereby effect the brightness of the real image.

3,603,677

CINEPROJECTOR

Tatsusuke Kadowaki, Yokohama-shi, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed July 23, 1969, Ser. No. 843,978
Claims priority, application Japan, July 24, 1968, 43/52237
Int. Cl. G03b 21/38
U.S. Cl. 352—124 5 Claims



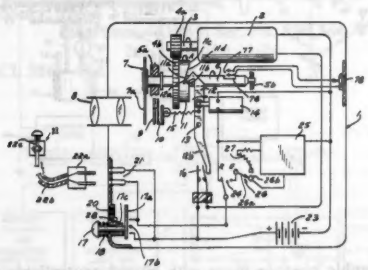
By rotating an operation changeover shaft from the exterior of a cineprojector, it may be set to a normal projection, a reverse motion projection, a stop or film-rewinding position. Upon completion of the normal projection, the cineprojector may be set to stop position automatically while when set to rewinding position the film is disengaged automatically from the pulldown mechanism. All of the operations may be effected from one position.

3,603,678

MOTION-PICTURE CAMERA

Peter Anderl, Munich; Johann Roth, Schwabhausen, and Theodor Steibl, Maisach, all of, Germany, assignors to Niezoldi and Kramer GmbH, Munich, Germany

Filed Jan. 13, 1969, Ser. No. 790,663
Claims priority, application Germany, Jan. 13, 1968, P 16 22 233.6
Int. Cl. G03b 21/38
U.S. Cl. 352—169 33 Claims



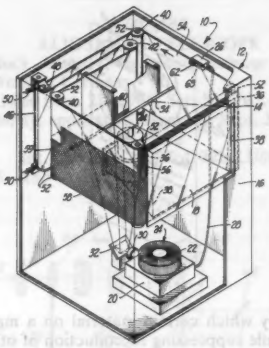
A motion-picture camera which can make a succession of exposures or individual exposures at variable intervals. The drive for the shutter and film-transporting mechanism is blocked in a predetermined position when the trigger is released, and the drive is unblocked by an electromagnet which is energized for a single short period, for a succession of short periods at variable intervals, or continuously in response to depression of the trigger. An electronic, or partly electronic and partly electromechanical, regulator which is built into the camera body controls energization of the electromagnet, at least when the camera is set to make individual exposures.

3,603,679

PROGRESSIVELY ILLUMINATED SIGNS

James F. Davis, 17154 Nordhoff St., Northridge, Calif.

Filed Aug. 9, 1968, Ser. No. 751,551
Int. Cl. G03b 21/22, 21/14
U.S. Cl. 353—75 4 Claims



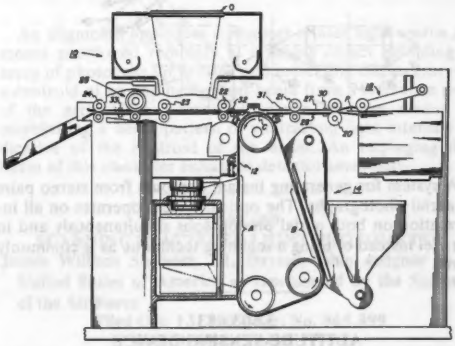
Illuminated signs are disclosed. Each of these signs has a viewing screen located with respect to a projector so that any of a series of different film or transparency frames may be projected on the screen by the projector so as to be capable of being viewed from the front of the screen. In each of these signs a shutter is continuously moved so as to control whether all or a portion of the projected image can be viewed on the screen. Means are provided for periodically projecting a different film frame in accordance with the shutter operation.

3,603,680

ULTRASONIC PAPER DETECTION

Edward D. Barton, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 24, 1969, Ser. No. 887,952
Int. Cl. G03g 15/00
U.S. Cl. 355—3 3 Claims



Paper jam detection system for use in a printing machine of the type having sheet feed and transporting means including a plurality of ultrasonic detection devices arranged along the paper path of movement to be influenced by each moving sheet, and circuit means for monitoring in timed sequence the effect upon each of the detection devices as sheets are transported.

3,603,681
METHOD OF REPRODUCING PREDETERMINED IMAGES

Lawrence R. Bortolotti, Carpentersville, and Howard K. Absler, Skokie, both of, Ill., assignors to Uarco Incorporated

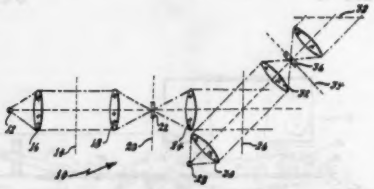
Filed Feb. 12, 1969, Ser. No. 798,748
Int. Cl. G03b 27/32
U.S. Cl. 355—17 10 Claims

A method by which certain material on a master can be reproduced while suppressing reproduction of other material on either the master or copy paper in xerography or like processes. The method uses a master which has the material to be copied printed in light absorbing ink, while the material on the master or copy paper to be suppressed during copying is printed in transparent ink. As examples, the master or copy paper can have background material or instructions printed in colored transparent ink, while the material desired to be reproduced from the master during copying is printed in light absorbing black ink on the master.

3,603,682
SYSTEM FOR GENERATING INSTANT CONTOURS FROM STEREO PAIRS OF AERIAL PHOTOGRAPHS

Nicholas K. Sheridon, Fairport, N.Y., and Daniel C. Kowalski, Southgate, Mich., assignors to The United States of America as represented by the Secretary of the United States Air Force

Filed Aug. 8, 1969, Ser. No. 848,423
Int. Cl. G01c 11/04; G02b
U.S. Cl. 356—2 5 Claims



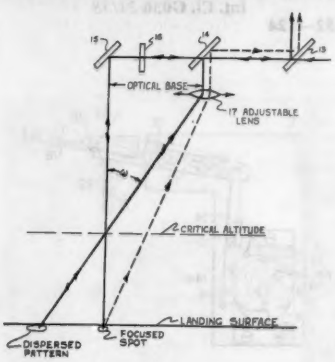
A system for generating instant contours from stereo pairs of aerial photographs. The optical system operates on all information on both aerial photographs simultaneously and in parallel instead of using a scanning technique as is commonly done.

3,603,683
ALTITUDE-SENSING DEVICE

T. O. Paine, Acting administrator of the National Aeronautics and Space Administration with respect to an invention of, and John A. Meyer, Tonawanda, N.Y.

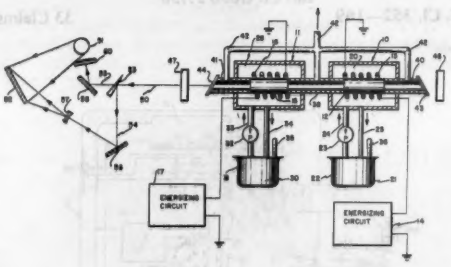
Continuation-in-part of application Ser. No. 417,848, Dec. 11, 1964, now abandoned. This application Dec. 16, 1968, Ser. No. 814,212
Int. Cl. G01c 3/08
U.S. Cl. 356—4 6 Claims

A device for signaling critical altitude of a flight vehicle above a landing surface formed of a high intensity light source; an optical system for reflecting the light beam downwardly towards the landing surface; a pair of optical systems for receiving images of the illumination produced by the beam; a light-responsive electrical system for generating a usable voltage signal when the vehicle is at the critical altitude.



3,603,684
RECORDING HOLOGRAMS OF OBJECTS WITH RANGE CONTOURS, assignor to Ralph F. Wuerker, Palos Verdes Estates, Calif. and TRW, Inc., Redondo Beach, Calif.

Filed Dec. 18, 1969, Ser. No. 886,077
Int. Cl. G02b 27/00; G01b 9/02
U.S. Cl. 356—109 17 Claims



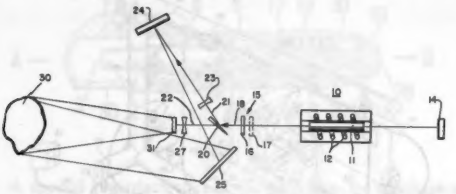
Holographic contour maps with closed controllable spacing of the range contours are made with one or two ruby lasers. For example, two ruby lasers may be provided, each being operated at a different temperature so as to illuminate the object with two separate frequencies. Alternatively, one of the rods may consist of pink ruby and the other of dark ruby. Also, two separate exposures may be taken, each being made with the ruby laser operated at a different frequency. This may be accomplished by selectively causing the ruby to lase at either a frequency corresponding to a transition R_1 or R_2. By controlling the material of the ruby, or its temperature or the particular transition being energized, the spacing of the range contours may be controlled or made adjustable.

The invention herein described was made in the course of or under a contract or subcontract thereunder, with the Department of the Air Force.

3,603,685
MULTIFREQUENCY LASERS FOR HOLOGRAPHIC CONTOURING

Lee O. Heflinger, Torrance, and Ralph F. Wuerker, Palos Verdes Estates, both of, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 18, 1969, Ser. No. 886,258
Int. Cl. G01b *9/02;* **G02b** *27/00*
U.S. Cl. 356—109 **11 Claims**



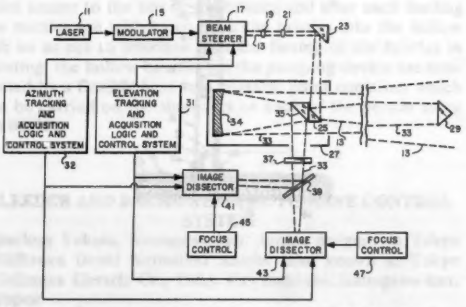
A ruby or other solid laser is made to generate two or more closely adjacent optical frequencies. By illuminating an object to be recorded holographically with the laser light, range contours are generated when the hologram is reconstructed. The range contours can be made to have distances on the order of 5 millimeters or more by utilizing a ruby laser. To this end, one of the two boundaries of the optical cavity for the laser is formed by a suitable mode selector, such, for example, as a Fabry-Perot resonant reflector, a prism or a grating. The thickness of the resonant reflector is so selected that two or more frequencies may be generated within the lasing linewidth of the laser. Preferably, in order to obtain better contrast, the optical length of the cavity is a multiple of the optical thickness of the resonant reflector.

The invention described herein was made in the performance of work under a NASA contract and is subject to the provisions of Section 305 of the National Aeronautics and Space Act of 1958, Public Law 85-568 (72 Stat. 435; 42 U.S.C. 2457).

3,603,686
ACQUISITION AND TRACKING SYSTEM FOR OPTICAL RADAR

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Charles L. Wyman; John M. Gould, Huntsville, Ala.; Robert E. Johnson, Williamville, N.Y., and Paul F. Weiss, Sudbury, Mass.

Filed June 4, 1969, Ser. No. 830,366
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 **8 Claims**

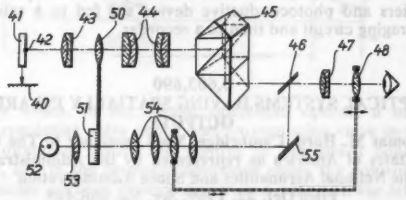


A laser-based tracking system is disclosed having the capability of automatically preforming an acquisition search to locate a target. In the acquisition mode, a laser beam and the instantaneous field of view of an image dissector photomultiplier are electronically and coaxially scanned over the same acquisition field. Upon acquisition of the target, the image dissector's instantaneous field of view is scanned across the target in a cross-scan pattern. The error signal is fed back to the center the laser beam and the cross-scan pattern on the target. If acquisition of the target is lost for a predetermined time the system returns to the acquisition mode to scan both the laser beam and instantaneous field of view of the image dissector over the acquisition field of view.

3,603,687
ALIGNMENT TELESCOPE

Fromund Hock, Wetzlar, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Filed Sept. 23, 1968, Ser. No. 761,495
Claims priority, application Germany, Sept. 30, 1967, P 16 23 502.2
Int. Cl. G01b *11/27;* **G02b** *23/00*
U.S. Cl. 356—153 **3 Claims**

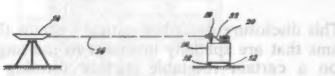


An alignment telescope is disclosed using optically active members which can be tilted or shifted for line-of-sight displacement, but whereby the resulting angular deflection of the line of subject is compensated, for leaving only a residual lateral displacement thereof.

3,603,688
ALIGNMENT APPARATUS

William Reid Smith-Vaniz, Darien, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 8, 1967, Ser. No. 681,476
Int. Cl. G01b *11/26*
U.S. Cl. 356—172 **6 Claims**



An alignment apparatus comprises a laser light source and means positioned remotely at a target object including an array of photocells for sensing and indicating displacement of a centroid of an impinging laser beam from a reference point of the array. The laser light source includes means for establishing a beam pattern of contrasting light intensity indicative of the centroid of the beam. An impinging light beam of this character enhances detector sensitivity.

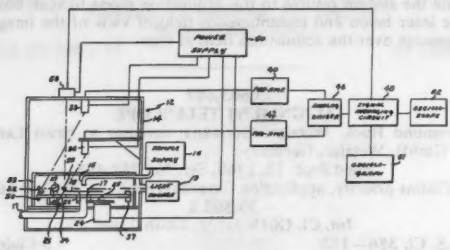
3,603,689
SCANNING SCATTERED LIGHT PHOTOMETER

James William Shelnutt, III, Dayton, Ohio assignor to the United States of America as represented by the Secretary of the Air Force

Filed Oct. 13, 1969, Ser. No. 865,899
Int. Cl. G01n *21/00, 21/40*
U.S. Cl. 356—103 **5 Claims**

A scanning scattered light photometer system having a rotor with a beamsplitter-polarizer and a nozzle for directing an aerosol flow along the axis of the rotor toward an exhaust outlet. The aerosol flow is illuminated by a collimated monochromatic unpolarized light. A polarizing beamsplitter on the rotor separates the scattered light into two perpendicular components. A first mirror on the rotor directs a first polarized component of light in the plane of rotation of the rotor toward a first photomultiplier. A second mirror on the

rotor directs light polarized perpendicular to the plane of rotation toward a second photomultiplier. A fixed mirror directs undispersed light toward a photoconductive device to provide a synchronizing output pulse when the polarizer



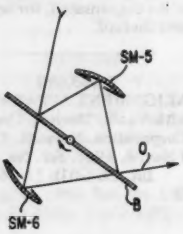
beamsplitter passes through the beam between the light source and the aerosol flow. The outputs of the photomultipliers and photoconductive device are fed to a ratio and averaging circuit and then to a recorder.

3,603,690

OPTICAL SYSTEMS HAVING SPATIALLY INVARIANT OUTPUTS

Thomas M. Hard, Cambridge, Mass., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 22, 1969, Ser. No. 868,445
Int. Cl. G01b *9/02, 21/48;* G01n *21/16*
U.S. Cl. 356—113 **13 Claims**



This disclosure describes optical systems that have output beams that are spatially invariant to the angle of incidence upon a certain rotatable surface forming a part of the systems, and can be used to select the wavelength of the output of an optical source, such as a laser cavity, or to aid in measuring the reflectance of a material in reflectance spectroscopy. The optical systems comprise various combinations of plane mirrors and plane diffraction gratings (or sample surfaces), in some embodiments, spherical mirrors. The plane mirrors, plane gratings and spherical mirrors are either rotated or fixed in space in accordance with a particular embodiment. The moveable suitable movement mechanism, such as a micrometer. By rotating the shaft of the micrometer to a particular incidence angle, the frequency of the output of a laser cavity can be selected. Alternately, the reflectance of a material can be observed for a particular angle. In either case, the output beam remains spatially invariant as the position of the shaft and its attached elements is changed.

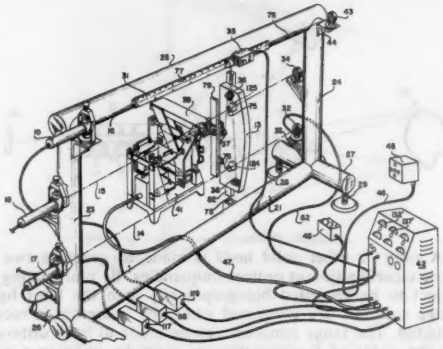
3,603,691

LASER CONTROL FOR AUTOMATIC ALIGNMENT OF STRUCTURES

Ralph A. Hamilton, Glendale, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed July 25, 1969, Ser. No. 844,952
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 **20 Claims**

An automatic part positioning system, such as may be used in tool or jig building, precisely locates or aligns the assembly components of large structures. Any misalignment of a component, with respect to a given spatial reference, is detected and appropriate error signals are generated which control a servosystem to move the component into alignment through three rectilinear axes and three angular axes, as required. These six degrees of freedom are referenced to one or more laser beams which establish the system's spatial reference.



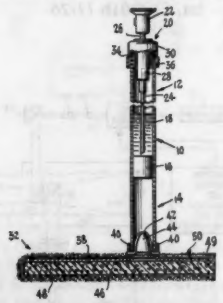
Multiple photoelectric targets, secured to the assembly component for movement therewith, respond to the laser beams to generate the necessary translational or rotational control signals for operation of the servosystem. Activation of the servosystem automatically brings the assembly component into a given position with respect to the system's basic spatial reference and thereafter maintains the established alignment.

3,603,692

COMBINED SPRAYER AND WIPER DEVICE

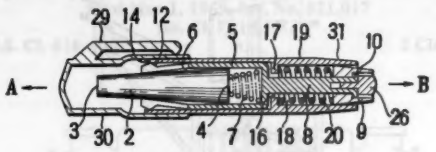
Charles W. Ball, 96 Orland St., Milford, Conn., and Alexander Brodsky, Fairfield, Conn., assignors to Richard Turico, New Haven, Conn., by said Brodsky

Filed Mar. 13, 1969, Ser. No. 806,876
Int. Cl. A47l *1/08*
U.S. Cl. 401—139 **2 Claims**



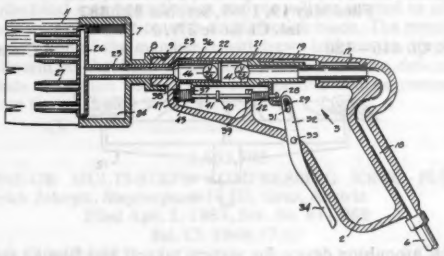
A sprayer and wiper device for windows, furniture and the like, having a tubular handle which pivotally mounts at one end a soft, absorbent wiper pad. The handle carries a cleaning or waxing solution and at its other end a spray device for spraying the solution on window or furniture surfaces. Thus with a single utensil the user can easily spray the desired surface and wipe the same.

3,603,693
AUTOMATIC PENCIL
Miyoshi Mori, Aichi-ken, and Miyako Hyoudou, Shizouka-ken, both of, Japan, assignors to Miyoshi Mori and Masauoshi Suganuma, Japan
Filed Oct. 13, 1969, Ser. No. 865,684
Claims priority, application Japan, Oct. 19, 1968, 43/91,429
Int. Cl. B43k 21/16
U.S. Cl. 401—81 9 Claims



A special receptacle like a fountain pen, or mechanical pencil to hold chalk, so that it may not soil the hands and may be carried and used sanitarily. A chalk-holding cylinder, of an elastic material, is made to slide freely within an outer cylinder, and at the bottom of the chalk-holding chamber of the cylinder, a pushout spring is provided.

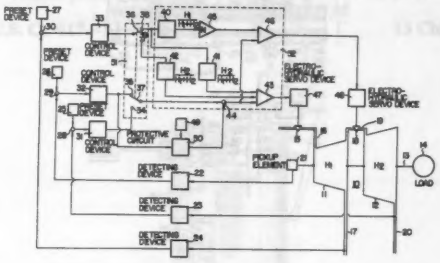
3,603,694
DEVI .E FOR FEEDING PAINT TO A PAINTING BRUSH
Ronald D. Hamm, 26 Chester Ave., Fairfax, Calif.
Filed Nov. 10, 1969, Ser. No. 875,438
Int. Cl. A46b 11/06
U.S. Cl. 401—150 4 Claims



A pistol-type handle on the end of which is a hollow hub to which are fixed the bristles of a paint brush; in the hollow handle is a trigger actuated mechanism to pump paint between the bristles of the paint brush; another point is that the pumping mechanism simultaneously with the pumping advances the paint feeding nozzles to feed the paint at the point nearer to the tips of the bristles and after each feeding the nozzles are withdrawn from the bristles into the hollow hub so as not to interfere with the flexing of the bristles in painting; the hollow handle and the pumping device are connected by a flexible hose to a portable paint container which can be carried on the shoulders or back of the person using the device.

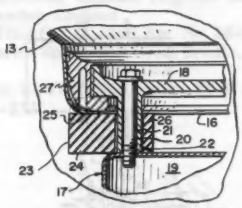
3,603,695
BLEEDER AND BACK-PRESSURE TURBINE CONTROL SYSTEM
Mitsuhisa Yokota, Kanagawa-ken, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha (also known as Tokyo Shibaura Electric Co., Ltd.), Kawasaki-shi, Kanagawa-ken, Japan
Filed July 7, 1969, Ser. No. 839,310
Claims priority, application Japan, July 8, 1968, 43/47146
Int. Cl. F01b 25/00
U.S. Cl. 415—17 9 Claims

Disclosed herein is a bleeder and back pressure turbine control system composed, essentially, of control devices respectively for rotational speed control, back pressure control, and bleeder pressure control, each control device detecting the required value and sending out a control signal; switching means operable for changing turbine operation to a constant speed operation or to a constant pressure operation, the back pressure control device being disconnected from the control system in the former operation, and the rotating speed control device being disconnected from the control system in the latter operation; and electrohydraulic control



devices which, in the former operation, operate a main steam-regulating valve and a bleeder-regulating valve in the same directions under the control of the speed control device, and in the reversing directions under the control of the bleeder pressure control device, and which, in the latter operation, operate merely the main steam-regulating valve under the control of the back pressure control device and the bleeder pressure control device.

3,603,696
DISHWASHER
Willian T. Lampman, St. Joseph, Mich., assignor to Whirlpool Corporation
Filed Mar. 12, 1970, Ser. No. 18,857
Int. Cl. F04b 21/00; B08b 3/00
U.S. Cl. 415—126 5 Claims

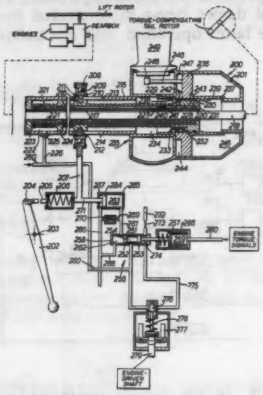


A dishwasher having a motor-pump unit normally positioned in a bottom opening in the tub of the dishwasher with the motor being located beneath the opening and the pump above the opening and within the tub and including a plurality of spaced resilient retainers on the unit movable into engagement with the motor and the bottom of the tub surrounding the opening in locking the unit in position but being movable to an inwardly projecting position when installing or removing the unit during which the dependent motor portion is passed through the tub opening which is larger than the motor portion of the unit.

3,603,697
ENGINE, PROPELLER AND ROTOR INSTALLATIONS
Arthur H. Lane, Innsworth, England, assignor to Dowty Rotol Limited, Gloucester, England
Filed Nov. 8, 1968, Ser. No. 774,471
Claims priority, application Great Britain, Nov. 17, 1967, 52496/67
Int. Cl. B64c 27/22
U.S. Cl. 416—33 11 Claims

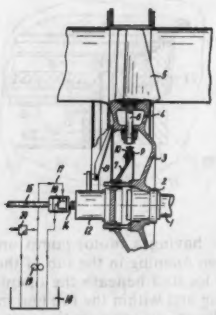
An engine propeller and rotor installation includes an engine-driven variable pitch propeller and a rotor which can,

under certain conditions, be driven by the engines with the propeller. Propeller pitch is adjustable by a pitch control system in response to input or datum signals and in response to engine torque signals. These signals are applied to the



system in a manner such that, without substantially reducing the power transmitted to the rotor, propeller blade pitch is changed to reduce power absorption by the propeller by an amount necessary for the engine to avoid reaching a stalled condition.

3,603,698
AXIAL FLOW FAN WHEEL
Carl Erling Jensen, Naestved, Denmark, assignor to Nordisk Ventilator Co. A/S, Naestved, Denmark
Filed Nov. 19, 1969, Ser. No. 877,918
Int. Cl. B63h *3/02*
U.S. Cl. 416—157 **10 Claims**



An axial flow fan wheel with adjustable blades controlled by a hydraulic-driving system comprising a working piston and a cylinder disposed coaxially within the wheel one of them being axially displaceable for adjusting the blades.

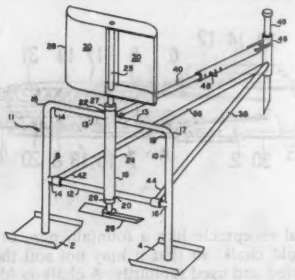
The system is supplied with hydraulic fluid with a constant pressure through an adjustment cylinder-piston system coaxially connected with the displaceable part of the driving system.

The working piston has a passage throttling the fluid flow.

The sum of the pressure drop through the piston and the drop in the adjustment cylinder-piston system equals the total pressure.

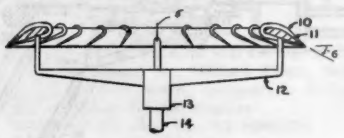
Displacing the adjustment piston relative to the adjustment cylinder disturbs the state of equilibrium. The working piston moves relative to the cylinder and reestablishes the equilibrium state in another position.

3,603,699
LIQUID AGITATOR
Budd Joe Brashear, 239 N.E. Queenstown, and Donald Max Stapleton, 216 N.E. Queenstown, both of Bartlesville, Okla.
Filed Mar. 16, 1970, Ser. No. 19,640
Int. Cl. C10j *1/18*; B01f *7/24*
U.S. Cl. 416—171 **11 Claims**



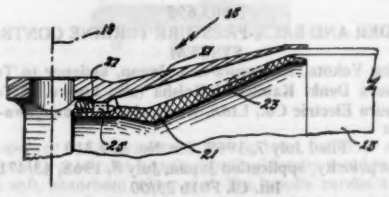
A readily portable and adjustable apparatus having an agitating means for contacting and agitating a liquid, adjusting arm elements for porting, positioning and adjusting said agitating means in said liquid, and a power source in operable association with said agitating means. Said power source can be a wind motor, an electric motor or combinations thereof.

3,603,700
ROTATING CIRCULAR WING
Michael Eskeli, 2932 Sandage Ave., Ft. Worth, Tex.
Filed May 19, 1969, Ser. No. 827,482
Int. Cl. B64c *27/10*
U.S. Cl. 416—180 **6 Claims**



A propulsion device for vertical takeoff and landing type aircraft consisting of one or more rotary circular wings; the wings being of circular shape but having standard airfoil cross sections with vanes on the surfaces to cause air to pass radially outwardly over the airfoil surfaces. Lift is produced by air passage over the airfoil surfaces in a manner similar to standard aircraft wings, but high velocity air flow and high lift is feasible regardless of the speed of the aircraft.

3,603,701
COMPOSITE ROTOR BLADE RETENTION
Tadeusz Tarcrynski, Ridley Park, Pa.
Filed Aug. 28, 1969, Ser. No. 853,873
Int. Cl. B64c *27/48*
U.S. Cl. 416—204 **3 Claims**



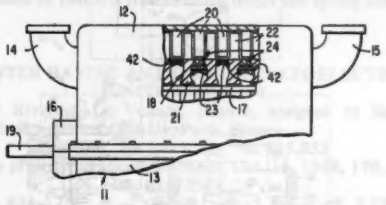
A system for transferring the dynamic loading forces from a composite rotor blade held between external and internal

metallic fittings. A lock nut in communication with a key serves to transmit torque from the internal fitting to the root end socket by preloading against the composite structure to induce compressive hoop stresses therein.

3,603,702
ROTOR ASSEMBLY

Richard C. Jensen, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 1, 1969, Ser. No. 821,017
Int. Cl. F01d 5/32
U.S. Cl. 416—220 2 Claims

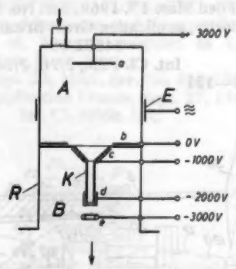


A rotor for use in a turbomachine comprising a shaft, a plurality of wheels axially connected to the shaft, and a plurality of blades mounted circumferentially about each of the wheels. Spacer rings are disposed between alternate wheels and are connected thereto to maintain the wheels in their spaced axial positions. Disposed above alternate spacer rings are a plurality of substantially cylindrical members having a removable portion. When a blade becomes defective, the cylindrical member adjacent thereto will be rotated to align the removable portion with the defective blade. The removable portion of the member is withdrawn to leave an opening adjacent to the base of the defective blade. The defective blade may then be slid into this opening and be removed from the machine.

3,603,703
ONE-OR MULTI-STEPS COMPRESSING IONIC PUMP

Erich Jakopic, Steyrergasse 17/III, Graz, Austria

Filed Apr. 1, 1969, Ser. No. 811,960
Int. Cl. F04b 37/02
U.S. Cl. 417—48 4 Claims

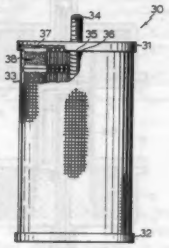


A one- or multisteps compressing ionic-pump which comprises means for providing a chamber of higher pressure and a chamber of lower pressure, and a separating wall nonpermeable to gas is disposed between the chambers. At least one channel member extends through the wall for the transportation of an ion stream therethrough. The channel member has a large stream resistance for the gas return-diffusing from the area of higher pressure into the area of lower pressure, and a high frequency alternating field is applied in front of the entrance to the channel member in the lower pressure chamber between an anode preset in front of the separating wall and in and behind the channel member in higher pressure chamber connected cathodes, so that particles of gas do not arrive at lower pressure in the space.

3,603,704
RADIANT HEAT REFLECTION IN DEVICES SUCH AS GETTER PUMPS

Mario Zucchinelli, and Bruno Ferrario, both of Milan, Italy, assignors to S. A. E. L. Getters S.p.A., Milan, Italy

Filed Oct. 14, 1969, Ser. No. 866,335
Claims priority, application Italy, Oct. 28, 1968, 844740
Int. Cl. F04f 11/00; H01j 7/16
U.S. Cl. 417—51 13 Claims

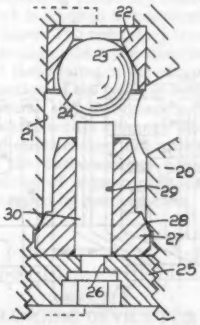


A heat reflector having a number of discrete spaced surfaces which present a substantially continual heat-reflecting surface wherein adjacent surfaces are offset with respect to each other sufficiently to provide for the passage of gas molecules at pressures within the molecular flow region as well as at higher pressures. These reflectors which have a high conductance to gases are especially useful when employed with getter pumps wherein they minimize radiant heat losses and reduce the amount of current necessary to heat the getter material employed in these pumps.

3,603,705
CHECK VALVES

Harin Chandraratna, London, England, assignor to C.A.V. Limited, London, England

Filed Oct. 7, 1969, Ser. No. 864,505
Claims priority, application Great Britain, Oct. 15, 1968, 48844/68
Int. Cl. F04b 5/00; E03c ; F04b 39/08
U.S. Cl. 417—253 1 Claim



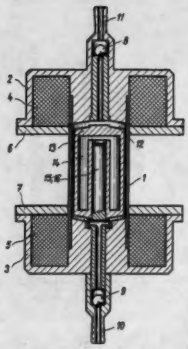
A check valve including a valve member which can cooperate with a seating to prevent flow of fluid in one direction and which can be lifted from its seating by pressure of fluid, the check valve including a piston which is actuated by a fluid pressure so that it urges the valve member onto the seating. In this manner the valve member is closed onto the seating as quickly as possible when the pressure of liquid acting to lift the valve member from the seating falls.

3,603,706

ELECTROMAGNETIC MICROPUMP FOR PROCESSING AGGRESSIVE LIQUID SUBSTANCES

Antonin Cermak, Praha; Slavomir Michalek, Praha, and Zdenek Strait, Rez U Prahy, all of, Czechoslovakia

Filed Mar. 25, 1969, Ser. No. 810,089
Claims priority, application Czechoslovakia, Mar. 26, 1968, 2320-68
Int. Cl. F04b *17/04*
U.S. Cl. 417—417 5 Claims



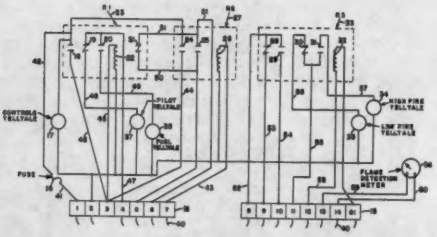
An electromagnetic micropump for processing aggressive liquid substances detrimental for human health, such as, for example, radioactive solutions, or the like. The micropump, is fully compact, explosion proof and packingless. Its pumping element is constituted by an electromagnet core adapted to reciprocate along a stationary piston between a pair of jacketed alternately energized solenoids.

3,603,707

MONITORING DEVICE

Eugene R. Stantz, deceased, late of 1045 Wallace Ave., Schenectady, N.Y. (by Irene F. Stantz, executrix) 1045 Wallace Ave., Schenectady, N.Y.

Continuation-in-part of application Ser. No. 687,001, Nov. 30, 1967, now abandoned. This application Mar. 2, 1970, Ser. No. 015,715
Int. Cl. F23n *5/24*
U.S. Cl. 431—16 10 Claims



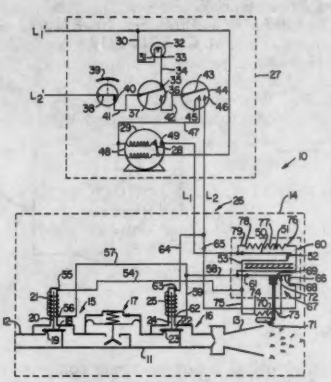
Monitoring device for use with large commercial and industrial gas, oil and combination gas-oil burners and burner-boiler units and their associated combustion control devices to continuously monitor and indicate by means of cooperatively associated telltales not only their normal operation, but also to discretely indicate when, where and why a failure or malfunction occurred, comprising controls telltale, pilot telltale, fuel telltale, low-fire telltale and high-fire telltale.

3,603,708

FUEL CONTROL SYSTEM AND PARTS THEREFOR OR THE LIKE

Arthur L. Good, Elkhart, Ind., assignor to Robertshaw Controls Company, Richmond, Va.

Filed July 9, 1968, Ser. No. 743,479
Int. Cl. F23q *9/08*
U.S. Cl. 431—45 24 Claims



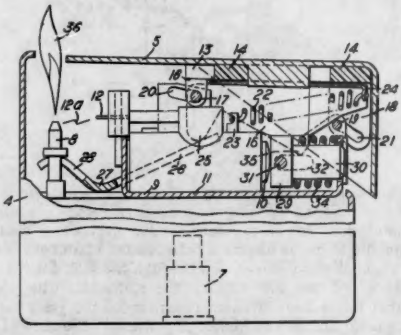
This disclosure relates to a fuel control system for a fuel-burning apparatus wherein an electrical switch is adapted to sense the nonignition condition and ignition condition of an electrically operated ignition means for a burner means in such a manner that when the system is initially energized, the switch means effects opening of a first valve means while energizing the ignition means and when the ignition means reaches an ignition condition, the switch means opens a second valve means to permit fuel to flow to the burner means while effectively disconnecting the electrical ignition means from the electrical power source. Such system includes a time delay means which will terminate the operation of the system if after a predetermined time period from the time the first valve means is initially opened, the second valve means does not open.

3,603,709

GAS BURNING CIGARETTE LIGHTER

William Retzler, Woodend, Wickham, England, assignor to Tetra Molectric Limited, London, England

Filed Mar. 17, 1969, Ser. No. 807,585
Claims priority, application Great Britain, Mar. 26, 1968, 14552/68
Int. Cl. F23q *2/16, 2/28*
U.S. Cl. 431—131 3 Claims



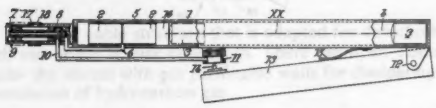
The invention is concerned with a gas-burning cigarette lighter having an ignition mechanism of the kind in which

gaseous fuel is ignited in an ignition zone downstream of a burner nozzle by means of a spark generated between a pair of electrodes by the impact of a hammer with a piezoelectric element, one of the hammer and element moving under spring action into engagement with the other of a hammer and element. The mechanism is operated by manual movement of an actuating member from the rest position to an operative position in which part of the actuating member lies outside the confines of the lighter body as defined when the actuating member is in the rest position. The operative movement of the actuating member causes firstly one of the hammer and element to move with the actuating member and away from the other one of the hammer and element to provide or to increase the impact stroke and to cock the mechanism and secondly one of the hammer and element to be released so that it is free to move under the spring action.

3,603,710
LIGHTER HAVING AN IMPROVED PIEZOELECTRIC IGNITION SYSTEM

Gabriel Riveron, Le Vesinet, France, assignor to Societe Flaminaire Marcel Quercia, Paris, France

Filed Oct. 13, 1969, Ser. No. 865,855
Claims priority, application France, Oct. 16, 1968, 170,162
Int. Cl. F23g *2/28*
U.S. Cl. 431—255 **2 Claims**



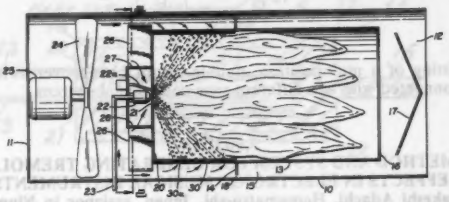
A gas lighter according to the invention has a weight slideable in a cavity within a housing of the lighter, the weight striking an abutment at the end of the cavity to stress a piezoelectric crystal and produce the ignition spark at the burner of the lighter. The weight is adapted to be moved to strike the abutment by gravity upon inverting the lighter, and or by giving the lighter a linear or centrifugal acceleration.

The said weight may also serve to close and open a gas supply valve.

3,603,711
COMBINATION PRESSURE ATOMIZER AND SURFACE-TYPE BURNER FOR LIQUID FUEL

Edgar S. Downs, P.O. Box 242, Worthington, Ohio

Filed Sept. 17, 1969, Ser. No. 858,759
Int. Cl. F23d *11/24*
U.S. Cl. 431—352 **1 Claim**



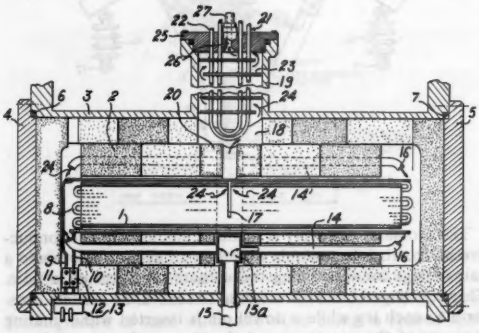
A burner for liquid fuel, such as oil, including a centrally disposed atomizing nozzle of the pressure type which receives the liquid fuel and atomizes it under pressure and sprays the atomized droplets forwardly and outwardly causing a substantial proportion of them to impinge against an annular wall of high porosity and of a nature to give a capillary effect so that the droplets are absorbed immediately and the oil thereof is spread throughout the area of the annular wall which serves as the inner wall of the combustion chamber. Primary air for combustion is supplied directly around the centrally disposed pressure-atomizing nozzle and secondary air for combustion is supplied directly through the porous and absorbent annular wall. A substantial part of the atomized oil, that of the smaller droplets, is burned as it passes from the atomizing nozzle and travels toward the surrounding wall in suspension and the remainder, that of the larger droplets, is burned at the exposed inner surface of the annular wall after it reaches it and is absorbed and spread over the area of the wall for evaporation and combustion.

ELECTRICAL

3,603,712
SINTERING FURNACE

Yves J. M. Masselot, Manosque, and Georges Poujol, Aix-en-Provence, both of, France, assignors to Commissariat L'Energie Atomique, Paris, France

Filed Sept. 23, 1969, Ser. No. 860,186
Claims priority, application France, Sept. 27, 1968, 167878
Int. Cl. H05b *3/62*
U.S. Cl. 13—20 **3 Claims**



A tube furnace for sintering parts which are loaded with organic products, the internal atmosphere of said furnace being heated to a high temperature by means of an electric resistor. The furnace comprises a tube surrounded by at least one layer of heat-insulating refractory material and an outer metallic casing which is adapted to cooperate at the extremities with leaktight doors. The refractory layer is traversed by a system of pipes through which the sintering gases flow and which serve to heat these latter in the vicinity of the heating resistor prior to injection of the gases at both ends of the furnace tube. A transverse slot is formed at the center of the tube and communicates with a chimney which traverses the refractory layer and outer casing. The chimney is fitted with a system whereby the carbonaceous compounds resulting from the decomposition of organic products during the sintering process are trapped by condensation.

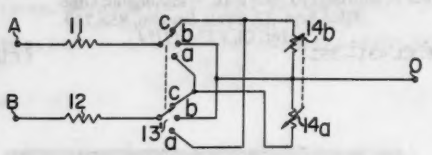
3,603,713
TONE COLOR CHANGING DEVICE FOR ELECTRONIC MUSICAL INSTRUMENTS

Akira Nakada, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka, Japan

Filed Apr. 2, 1969, Ser. No. 812,816
Int. Cl. G10h *1/06, 5/00*
U.S. Cl. 84—1.19 **7 Claims**

A simple, versatile, and quickly operable tone color changing device comprising a combination of a variable means which may be a multiposition changeover switch or a plurali-

ty of variable resistors interlinked with an operable means such as a knee-lever, and a selecting means preferably consisting of a multiposition, double-circuit changeover switch connected with two different tone color signal sources.

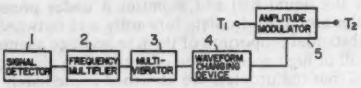


3,603,714

METHOD AND SYSTEM FOR GENERATING TREMOLO EFFECTS IN ELECTRONIC MUSICAL INSTRUMENTS

Takeshi Adachi, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Oct. 1, 1969, Ser. No. 862,856
Claims priority, application Japan, Oct. 4, 1968, 43/71863
Int. Cl. G10h *1/04*
U.S. Cl. 84—1.25 **6 Claims**



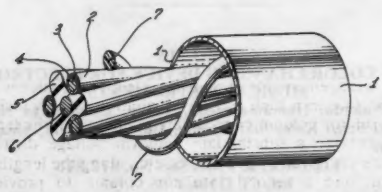
In an electronic organ having plain keys, tremolo effects or mandolin effects are obtained by a system which comprises a pulse-generating circuit of such construction as to detect lateral movements of the playing keys and produce a detected signal in accordance with the lateral movement, which pulse generating circuit further frequency-multiplies the detected signal and shapes the frequency-multiplied signal into a pulse, which circuit further includes a conversion circuit wherein the waveform of the pulse is converted into a desired form, and an amplitude-modulation circuit wherein the amplitude of a musical signal delivered by the manipulation of the playing keys is modulated in accordance with the waveformed pulse. With this system, tremolo effects or mandolin effects are obtained by the lateral manipulation of the playing keys.

3,603,715

ARRANGEMENT FOR SUPPORTING ONE OR SEVERAL SUPERCONDUCTORS IN THE INTERIOR OF A CRYOGENIC CABLE

Bernd Eilhardt, Vinnhorst, and Gerhard Karl Ziemek, Hannover, both of, Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Dec. 1, 1969, Ser. No. 881,210
Claims priority, application Germany, Dec. 7, 1968, P 18 13 397.6
Int. Cl. H01b *7/34*
U.S. Cl. 174—15 **5 Claims**



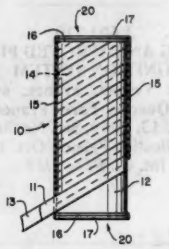
Superconductor string elements are disposed in grooves on a carrier extending in helical twist along the carrier axis, the carrier being disposed and coaxially maintained in a tube passed through by cryogenic liquid.

3,603,716

SUPERCONDUCTING R.F. RADIATION SHIELD FOR HIGH Q CIRCUITS

Heiman W. Koren, Huntington, N.Y.; Nicolas Worontzoff, Islip Terrace, N.Y.; Kenneth Siegel, deceased, late of Old Bethpage, N.Y. (Bernice Siegel, executrix), and Yehuda Klinger, Huntington, N.Y., assignors to The United States of America as represented by the Secretary of the Army

Filed June 27, 1969, Ser. No. 845,119
Int. Cl. H05k *9/00*
U.S. Cl. 174—35 TS **8 Claims**



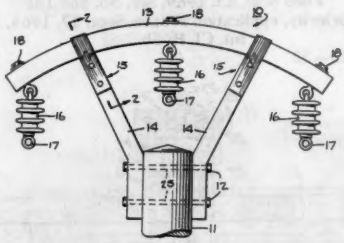
This invention relates to a superconducting R.F. radiation shield and method of constructing said shield. The shield structure is fabricated by wrapping a superconducting ribbon around a cylindrical form with an approximately 50 percent overlap. A thin Teflon tape is employed to insulate successive turns of the ribbon. End plugs may be provided by placing a flat sheet of Teflon across each end covered by a wide sheet of superconducting foil thereby providing an improved R.F. radiation shield for enclosing a superconducting circuit.

3,603,717

CROSSARM ASSEMBLY

Arthur L. Scott, Columbia, S.C., assignor to C/P Corporation, Columbia, S.C.

Filed Jan. 7, 1970, Ser. No. 1,175
Int. Cl. H02g *7/20*; E04h *12/24*
U.S. Cl. 174—45 R **14 Claims**



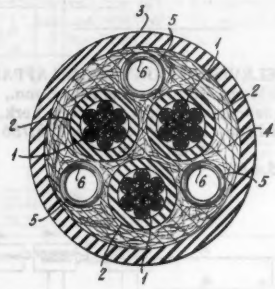
The crossarm assembly is made of electrically nonconductive noncorrosive materials within an arcuate crossarm and a pair of legs for supporting the arcuate crossarm on a pole. Channel-shaped brackets are used to secure the arcuate crossarm to each leg while a dowel pin is inserted within mating recesses of the crossarm and the support legs in order to position the crossarm and to resist the loading of the crossarm.

3,603,718

ELECTRICAL CABLE STRUCTURE

Rudolf Karl Heinz Gedenk, Celle, Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Apr. 10, 1970, Ser. No. 27,342
Claims priority, application Germany, Apr. 14, 1969, P 19 18 841.1
Int. Cl. H01b 7/00
U.S. Cl. 174—47 7 Claims



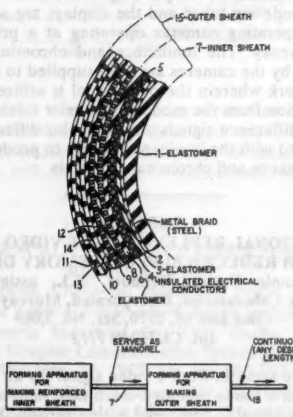
Electrical cable structure that is adapted for downhole oil well use or for similar conditions. There are open channels under the sheath with gas permeable walls for dissipating accumulation of hydrocarbon gas.

3,603,719

FLEXIBLE TUBES HAVING INNER SHEATH SERVING AS MANDREL FOR OUTER SHEATH AND METHOD OF MAKING SAME

Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie, Clermont-Ferrand, France

Filed Oct. 13, 1969, Ser. No. 865,861
Claims priority, application France, Oct. 23, 1968, 171,116
Int. Cl. F16l 11/08, 11/12; B29d 23/00
U.S. Cl. 174—47 11 Claims



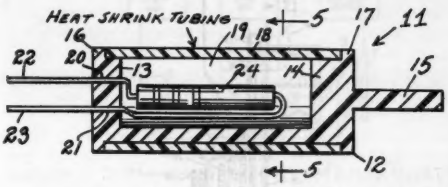
A flexible tube is formed with an outer sheath comprising reinforcing steel cords helically wound and distributed in an even number of layers and an inner sheath comprising a reinforcing braid of steel wires, the wires being in spaced-apart relation to each other. The inner sheath resists crushing and twisting and serves as a mandrel for the manufacture of the outer sheath.

3,603,720

HOUSED ELECTRONIC COMPONENT ASSEMBLY

Lee C. Rabie, 4602 S.W. Rose St., Seattle, Wash.

Filed Aug. 21, 1970, Ser. No. 65,994
Int. Cl. H05k 5/00
U.S. Cl. 174—52 R 9 Claims



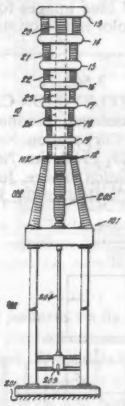
A holder consisting of a body of insulating material having a cavity to receive an electronic component. The body has holes in its end wall through which the wire terminals of the component project to act as terminal prongs engageable in a female socket. The body is surrounded by a length of heat shrink tubing to enclose the component. The body has one flat longitudinal wall perpendicular to the plane of the two projecting prongs so as to identify the polarity of the prongs.

3,603,721

INSULATOR COLUMN ARRANGEMENTS FOR A HIGH POWER ELECTRICAL DISTRIBUTION SYSTEM

Arem Foti, and Roy H. Albright, both of Greensburg, Pa., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Feb. 9, 1970, Ser. No. 9,525
Int. Cl. H01b 17/48
U.S. Cl. 174—141 R 9 Claims

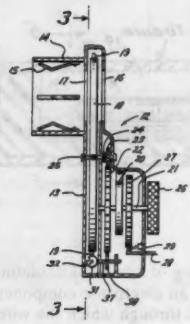


An arrangement for supporting electrical switches, buses and the like in a high power distribution system includes a first insulator column capacitively graded along its length so as to provide a substantially uniform voltage distribution from the energized switch or bus, etc., along the length of the column, and a second insulator column to provide the mechanical support for the electrical apparatus and for the first column. When so arranged, the two columns present an overall hourglass appearance and simultaneously exhibit desirable electrical and structural characteristics.

3,603,722
COLOR TELEVISION SYSTEM

Olin L. Graham, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed June 26, 1970, Ser. No. 50,206
Int. Cl. H04n 9/02, 9/06, 9/34
U.S. Cl. 178—5.2 R 11 Claims

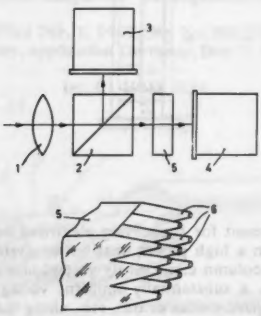


A spring-driven optical filter wheel is rotatably mounted in front of the lens of a monochrome television camera. The wheel includes red, green and blue filter sectors and an opaque sector, the latter producing a completely black frame in the resulting video signal. The picture-reproducing apparatus located at the receiving station includes a monochrome television monitor having a second optical filter wheel rotatably mounted in front of the picture tube thereof. A counter counts the vertical sync pulses in the received video signal and advances this second filter wheel at the same rate as are occurring the completely single color frames in the video signal. A black frame detector detects the occurrence of a black frame and synchronizes the counter. A gate circuit is controlled by the counter to pass only completely single color video frames to the picture tube. A color film camera exposes a given segment of color film to the individual red, green and blue images following a given black frame to record a full color image on such segment.

3,603,723
COLOR TELEVISION CAMERA

Sing Liong Tan, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 29, 1968, Ser. No. 733,108
Claims priority, application France, June 19, 1967, 110938
Int. Cl. H04n 9/08, 3/22
U.S. Cl. 178—5.4 R 6 Claims

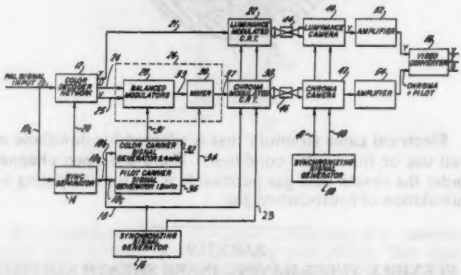


concentrating color television camera employing at least two camera tubes one of which provides a luminance signal, and the other of which provides chrominance signals. A light-beam splitter directs a portion of the light from the image to the photosensitive layer of the luminance camera tube in which a potential image corresponding to the visible image is formed and another portion to the chrominance camera tube for producing chrominance signals. Between the light-beam splitter and chrominance camera tube, a member capable of concentrating the light on a given number of areas evenly distributed throughout the surface of the photosensitive layer is provided. Scanning of the photosensitive layer by an electron beam thus supplies a chrominance signal which transmits the moving parts of the scene substantially without inertia.

3,603,724
COLOR TELEVISION CONVERSION APPARATUS

Renville H. McMann, Jr., New Canaan, Conn., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed June 26, 1969, Ser. No. 836,756
Int. Cl. H04n 5/02
U.S. Cl. 178—5.4 C .8 Claims



As described herein, PAL Color television signals having a fixed frame frequency are supplied to a color decoder network which recovers and supplies as separate outputs luminance and chrominance representative signals. A pair of balanced modulators are provided for modulating a high frequency color carrier signal in accordance with the chrominance signals and a mixer circuit combines the modulation sidebands of the color carrier signal with a pilot signal having a frequency which bears a fixed relation to the color carrier frequency. The luminance signals and combined modulation sidebands and pilot signal are then supplied to a pair of cathode-ray tubes and the displays are scanned by a pair of cooperating cameras operating at a predetermined frame frequency. The luminance and chrominance signals reproduced by the cameras are then supplied to a video converter network wherein the pilot signal is utilized to extract the modulation from the modulated carrier sidebands to provide color difference signals and the color difference signals are combined with the luminance signals to produce standard NTSC luminance and chrominance signals.

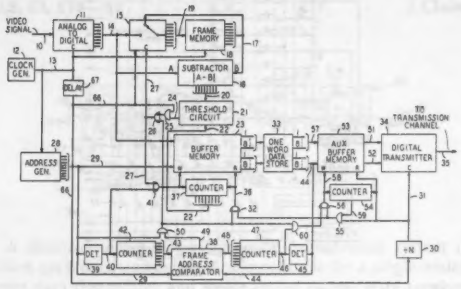
3,603,725
CONDITIONAL REPLENISHMENT VIDEO SYSTEM WITH REDUCED BUFFER MEMORY DELAY

Cassius Chapin Cutler, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 15, 1970, Ser. No. 3,069
Int. Cl. H04n 7/12
U.S. Cl. 178—6 12 Claims

Amplitude samples from a video signal for an entire frame are stored in a frame memory. Each new sampled amplitude of the video signal is compared with a previously stored amplitude corresponding to the same spatial point in the video frame. If the difference between the two amplitudes exceeds a threshold value, the new amplitude replaces the old sample in the frame memory and is written into a buffer memory apparatus for storage prior to transmission to a receiving location. An address word is generated for each sample in order to indicate by its value the location of its corresponding sample within the video frame. The address word for each selected sample is also written into the buffer memory which

is read on a first-in-first-out basis. The address of each new sample is compared with the address of a sample being held by the buffer memory apparatus in readiness for transmission to the receiving location. If the two addresses being compared correspond to the same spatial point in the video frame, the new sample is written into the buffer memory and



the old sample is read out of the buffer memory even though the latter sample may not be coupled by the buffer memory apparatus to a transmitter for transmission to the receiving location. As a result, less delay is introduced by the buffer memory apparatus since the most recent amplitudes for the spatial points are coupled to the transmitter.

3,603,726

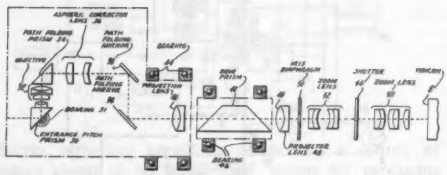
ELECTRO-OPTICAL SIMULATOR SYSTEM

Donovan L. Garber, North Canton; James N. Seidelle, Cuyahoga Falls, Ohio, and John R. Miles, Glenview, Ill.

Filed Jan. 22, 1969, Ser. No. 793,147

Int. Cl. G02b *15/00;* **G09b** *9/08;* **H04n** *7/18*

U.S. Cl. 178—6 **2 Claims**



In an aircraft simulator training device an assembly of computer controlled movable lens and television camera-and-display combinations is arranged to simulate the effects of yaw, pitch, roll, and changes in azimuth and range.

3,603,727

VARIABLE SCALE SCANNING SYSTEM FOR IMAGE REPRODUCTION

Masao Kinugawa, Chofu-shi; Masachika Ikeda, MItaka-shi, and Yutaka Tanaka, Tokyo, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan and Matsushita Graphic Communication Systems Inc.

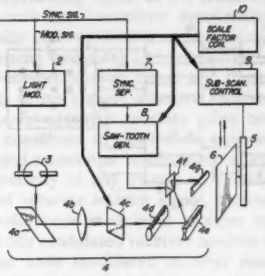
Filed Mar. 24, 1969, Ser. No. 809,793

Claims priority, application Japan, Mar. 29, 1968, Mar. 29, 1968, Mar. 29, 1968, 43/20,208; 43/20,209; 43/20,210

Int. Cl. H04n *1/04, 1/24, 1/32*

U.S. Cl. 178—6.7 R **3 Claims**

In an apparatus wherein a first record is scanned to be converted to an electric signal which is transmitted to a remote place where a second record is reproduced from said electric signal by scanning a recording medium with light rays emanating from a light source which is intensity modulated with said electrical signal, a variable scanning system using a vibrating mirror for effecting the main-scanning, wherein the scanning width in the main-scanning direction is changed by changing the vibration range (amplitude) of said vibrating mirror, and the subscanning speed and the size of the



scanning light spot are controlled corespondingly to change the scanning width in the subscanning direction, thereby producing a received picture (recorded or produced picture) which is magnified or reduced as desired.

3,603,728

POSITION AND DIRECTION DETECTING SYSTEM USING PATTERNS

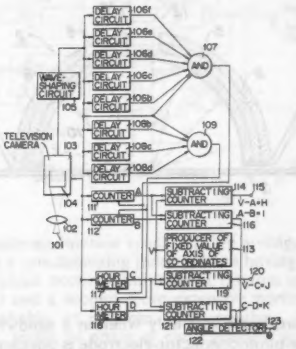
Yoshiaki Arimura, Kawasaki-shi, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Dec. 26, 1968, Ser. No. 786,882

Claims priority, application Japan, Dec. 28, 1967, 42/83698/

Int. Cl. G06k *9/12;* **H04n** *5/30, 7/18*

U.S. Cl. 178—6.8 **4 Claims**



A fine object having patterns on its predetermined surface portions is scanned to produce an image signal containing a pattern signal component. The shape of each pattern is such that the pattern signal component consists of pulses of a predetermined width, interval and number. The image signal is converted and further passed through operation circuits to detect the direction and position of the fine object.

3,603,729

MOTION DETECTOR SYSTEM WHICH SAMPLES ONLY A PRESELECTED AREA

Martin Sperber, Cranford, N.J., assignor to Squires-Sanders, Inc., Liberty Corner, N.J.

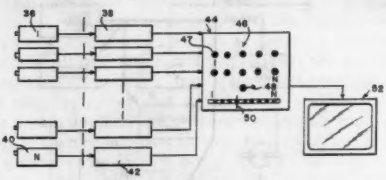
Filed Mar. 13, 1969, Ser. No. 807,039

Int. Cl. H04n *7/18*

U.S. Cl. 178—6.8 **18 Claims**

A selected part of a television surveillance camera field is selected for motion detection by variable *x–y* selection cir-

cuits; each successive signal sweep of this sample area is alternately fed to one of a pair of capacitive memory circuits the output of which are supplied to a differential comparator



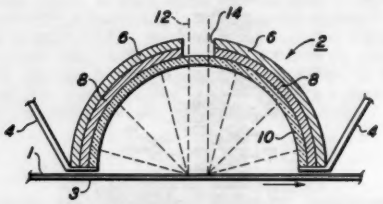
circuit to detect changes in the signals between successive sweeps of the selected area, a change in signal producing an output from the differential comparator which activates an alarm.

3,603,730

PHOTORECEPTOR ASSEMBLY

John W. Weigl, Webster, N.Y., and Hazen L. Hoyt, III, Glendora, Calif., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 6, 1969, Ser. No. 831,058
Int. Cl. H04n *1/04*
U.S. Cl. 178—7.1 **9 Claims**



A photoreceptor assembly wherein a sandwich structure of electrode-photoconductor-electrode is positioned adjacent a document to receive reflections therefrom as a scanning beam passing through an elongated slot in the structure is swept across the document which is moved in a direction transverse to the slot.

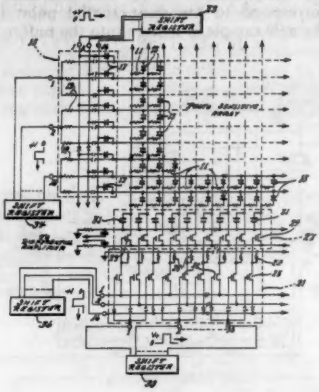
3,603,731

DIGITAL SCANNING MOSAIC PHOTOSENSING SYSTEM

Paul K. Weimer, Princeton, N.J.

Filed Aug. 27, 1969, Ser. No. 853,420
Int. Cl. H04n *3/12*
U.S. Cl. 178—7.1 R **3 Claims**

A photosensitive array together with field effect transistors are coupled to the array's columns for video coupling; Schottky-barrier diodes are connected to the rows for vertical decoding, and field effect transistors are connected to the columns for horizontal decoding, the vertical and horizontal decoders being activated in sequence by two pairs of different speed shift registers. The diodes and transistors are formed by thin film evaporation, the diodes having a cadmium sulfide-tellurium interface and the transistors using a cadmium-selenide semiconductor. Double



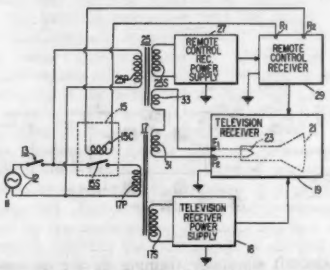
gate field effect transistors can be used as combination decoders and video couplers.

3,603,732

INSTANT-ON CIRCUITRY FOR SOLID STATE TELEVISION RECEIVERS

John Barrett George, Indianapolis, Ind., assignor to RCA Corporation

Filed June 5, 1969, Ser. No. 830,645
Int. Cl. H04n *3/16*
U.S. Cl. 178—7.5 R **5 Claims**

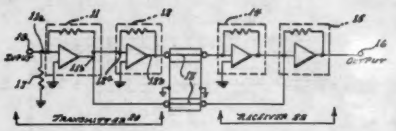


In a solid state television receiver, the primary windings of a main and an auxiliary transformer are both coupled across an AC input line. A single-pole, single-throw switch interposed in one conductor of AC input line subsequent to auxiliary transformer takeoff point permits deenergization of main transformer primary winding without interrupting energization of auxiliary transformer primary winding. One secondary winding of main transformer provides AC input to television receiver power supply. Kinescope filament is energized by circuit comprising a secondary winding of auxiliary transformer in series with an additional secondary winding of main transformer. When switch is closed, receiver is "on" with power supply operative and kinescope filament receiving full rated voltage comprising sum of secondary contributions. When switch is open, receiver is in "standby" condition—with power supply inoperative, but kinescope filament energized at reduced level representing contribution of auxiliary transformer secondary alone. In remote control embodiment, auxiliary transformer has additional secondary winding providing AC input to remote control receiver power supply.

3,603,733
PUSH PULL AMPLIFIER DRIVEN BALANCED TRANSMISSION SYSTEM

Robert B. Alterman, Monterey Park, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed July 15, 1969, Ser. No. 841,941
Int. Cl. H04l 25/08
U.S. Cl. 178—68 3 Claims

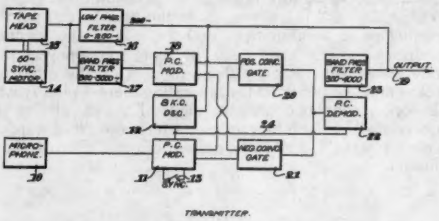


A direct-coupled long-range data transmission system in which each data transmission channel includes a single-ended input data transmitter and single-ended output data receiver interconnected by a balanced pair of transmission line and driven by push-pull amplifiers.

3,603,734
SECRET SIGNALLING SYSTEM

Robert C. Woodhead, Ottawa, Ontario, Canada, assignor to The Minister of National Defense of Canada

Filed Feb. 24, 1950, Ser. No. 146,015
Int. Cl. H04m 1/68
U.S. Cl. 179—1.5 C 2 Claims

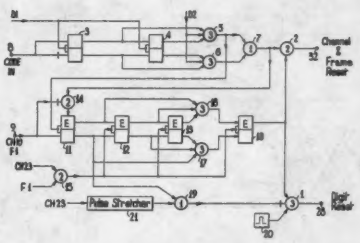


Secret signalling apparatus comprising a source of a message signal to be transmitted, means for producing a transmitter random signal and a transmitter synchronizing signal from a transcription, means for producing a transmitter pulse code sampling frequency having a predetermined phase and frequency relationship with the transmitter synchronizing signal, a first and a second transmitter pulse code modulator each responsive to said sampling frequency and connected respectively to pulse code modulate the transmitter random signal and to pulse code modulate the message signal thereby determining the polarity of each of said transmitter random signal and said message signal at any instant, means adapted to compare the pulse code modulated message signal with the pulse code modulated transmitter random signal and to produce a pulse code modulated transmitter resultant signal comprising a pulse for each occurrence of a predetermined polarity relationship between the pulse code modulated message signal and the pulse code modulated transmitter random signal, a pulse code demodulator responsive to said sampling frequency and connected to demodulate the transmitter resultant signal, transmitter means arranged to transmit the transmitter synchronizing signal and the pulse code demodulated transmitter resultant signal to a receiver, receiver filter means adapted to separate the transmitter synchronizing signal from the pulse code demodulated transmitter resultant signal, means for producing a receiver random signal and a receiver synchronizing signal from a duplicate of said transcription, means for unison-synchronizing the receiver synchronizing signal with the received transmitter synchronizing signal, means responsive to the transmitter synchronizing signal and adapted to produce a receiver pulse code sampling frequency having the same phase and frequency relationship with the received transmitter synchronizing signal as the transmitter sampling frequency has with the transmitter synchronizing signal, a first receiver pulse code modulator responsive to the receiver pulse code sampling frequency and connected to pulse code modulate the receiver random signal and thereby to determine its polarity at any instant, a second receiver pulse code modulator responsive to the receiver pulse code sampling frequency and connected to pulse code modulate the pulse code demodulated transmitter resultant signal and thereby to determine its polarity at any instant so producing a pulse code modulated receiver interim signal, means adapted to compare the pulse code modulated receiver interim signal with the pulse code modulated receiver random signal and to produce a pulse code modulated receiver resultant signal comprising a pulse for each occurrence of said predetermined polarity relationship between the receiver interim signal and the pulse code modulated receiver random signal, and a pulse code demodulator arranged to pulse code demodulate the receiver resultant signal.

3,603,735
SYNCHRONIZING ARRANGEMENT FOR A PULSE-COMMUNICATION RECEIVER

Donald Jack Cleobury, Hinckley, England, assignor to The General Electric Company Limited

Filed July 7, 1969, Ser. No. 839,579
Claims priority, application Great Britain, July 5, 1968, 32242/68
Int. Cl. H04j 3/06
U.S. Cl. 179—15 BS 9 Claims



A pulse-code-modulation synchronizing arrangement for a system using a synchronizing pulse pattern having a first simple portion which occurs commonly at random in the transmitted signal and a second more extensive portion which is highly improbable at random. The receiver, in seeking synchronism, resets its phase at each genuine and false occurrence of the simple portion. Synchronism is confirmed if no further reset occurs during the extent of the second portion (which does not contain the simple portion). The above resetting is on a channel basis: digit synchronism is achieved by slipping a digit periodically with sufficient intervening time to obtain overall synchronism by channel resetting if the digit phase is in fact correct. Loss or absence of synchronism is rapidly determined by the closely repeated presence of the common first portion.

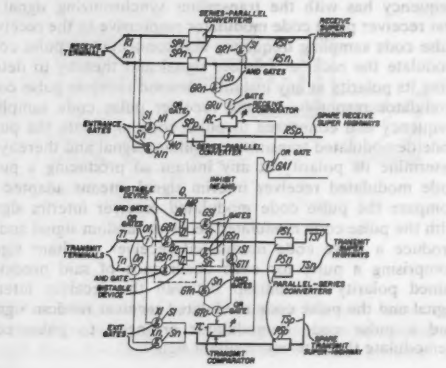
3,603,736
TELECOMMUNICATION EXCHANGES

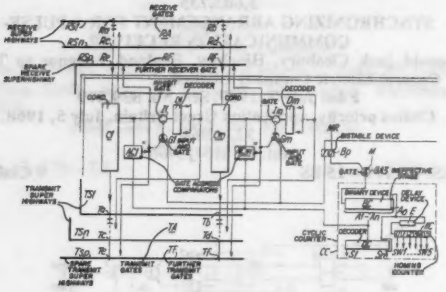
Terence David Morroll, Beeston, England, assignor to Ericsson Telephones Limited, Ilford, England

Filed Sept. 5, 1969, Ser. No. 855,524
Claims priority, application Great Britain, Sept. 24, 1968, 45406/68
Int. Cl. H04j 3/14
U.S. Cl. 179—15 BF 4 Claims

A telecommunication exchange having groups of highways carrying pulse code modulated signals and, for each group, a

working superhighway shared by signals carried on the highways of the group, which exchange includes a working spare superhighway to which signals are applied simultaneously with their application to the working superhighways and fault detection means responsive to a fault on a working superhighway or on the working spare superhighway to suppress transmission over the faulty superhighway.





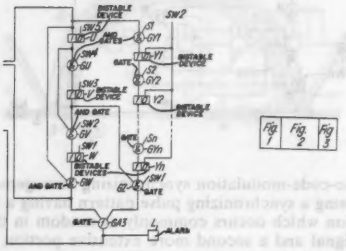
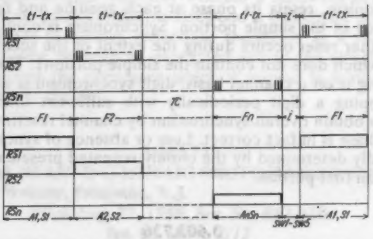


Fig 1 | Fig 2 | Fig 3

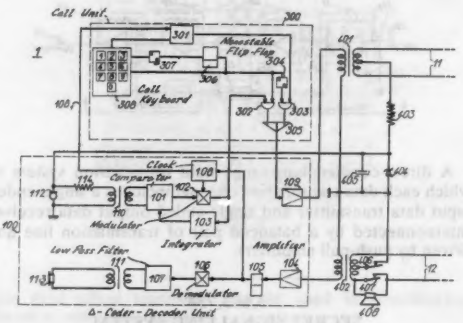


3,603,737

CALL SYSTEM FOR TIME-DIVISION, DELTA-CODE SWITCHING NETWORK

Maurice F. Le Dorh, 34 rue Branly, Perros-Guirec; Yves H. Le Goffic, Pavillon no. 3 Saint Roch, Lannion, and Fernand R. Arnouat, Pen an Rue, Lannion, all of, France

Filed Sept. 15, 1969, Ser. No. 857,687
Claims priority, application France, Sept. 13, 1968, Jan. 24, 1969, 166,157;69 01448
Int. Cl. H04j *3/12*
U.S. Cl. 179—15 AP **3 Claims**



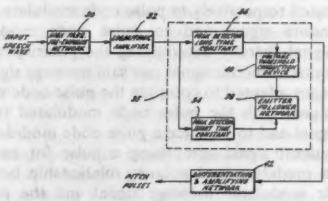
Call system for time-division Δ-code switching system in which the telephone sets comprise a Δ-modem and a keyboard arrangement sending the call numbers expressed in a binary code. The call number comprises a variable call pulse combination, two fixed pulse combinations framing the pulse code combination and a predetermined number of bits of the same value forming a group preceding the call pulse combination and identifying it. As the bits the call pulse and framing pulse combinations and the bits of the identifying group on the one hand have the same frequency as the Δ-code pulses generated by the Δ-modem on the other hand, means must be provided for separating them. In the switching network a counter counts the digits of the identifying group and controls a switching circuit which directs towards two separate ways the Δ-code pulses and the bits of the call number.

3,603,738

TIME-DOMAIN PITCH DETECTOR AND CIRCUITS FOR EXTRACTING A SIGNAL REPRESENTATIVE OF PITCH-PULSE SPACING REGULARITY IN A SPEECH WAVE

Louis R. Focht, Huntington Valley, Pa., assignor to Philco-Ford Corporation

Filed July 7, 1969, Ser. No. 862,101
Int. Cl. G10l *1/00*
U.S. Cl. 179—1 SA **9 Claims**



A time-domain detector circuit for producing a signal representative of the pitch pulses of a speech wave. The circuit comprises two peak detectors having two different time constants to which the input speech wave is supplied. The output of the shorter-time-constant detector is supplied to an isolating stage (e.g., an emitter follower network). The output of the longer-time-constant peak detector is connected, via a zener diode, to the output terminal of the emitter-fol-

lower network. A differentiator circuit is connected to the output terminal of the longer-time-constant detector. When the potential difference across the zener diode rises to a sufficiently high value, the zener-diode conducts, enabling the emitter follower network to load the longer-time-constant peak detector. The shorter-time-constant peak detector detects the pitch pulses and supplies them to the output terminal of the longer-time-constant detector. When the amplitude level of the speech wave is relatively constant, the zener diode isolates the output of the shorter-time-constant detector from the output terminal of the other detector and only the long-time-constant detector supplies an output signal thereto.

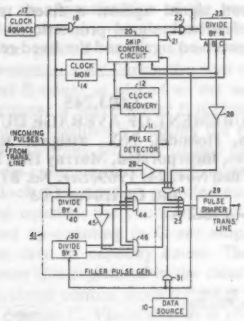
One circuit includes an input speech wave, a clipper, ramp generator, peak detector and low-pass filter connected in series. Another circuit includes pitch pulses, a pulse width-to-amplitude converter, a sample-and-hold circuit, a differentiator and a second sample-hold circuit connected in series with delayed pitch pulses timing each sample and hold circuit.

3,603,739

DIGITAL TRANSMISSION SYSTEM EMPLOYING IDENTIFIABLE MARKER STREAMS ON PULSES TO FILL ALL IDLE CHANNELS

James O. Edson, Mansfield Township, Warren County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1969, Ser. No. 885,825
Int. Cl. H04j *3/06*
U.S. Cl. 179—15 AL **4 Claims**



N-digital-sources distributed along a one-way transmission system are multiplexed by having the first such source insert its information in the first time slot of a frame which is defined by apparatus associated with the first source and predetermined pulse signals in each of the other time slots. Apparatus associated with the next source along the transmission system recognizes the location of the second time slot of the frame by examining the received signal to ascertain the existence of one of the predetermined signals in one time slot and a signal not having the characteristics of one of said predetermined signals in the preceding time slot. The apparatus associated with the second source then deletes the predetermined signal from the second time slot and inserts its information in that slot. This process is repeated by each source along the transmission line, with each source inserting its information in the next succeeding time slot.

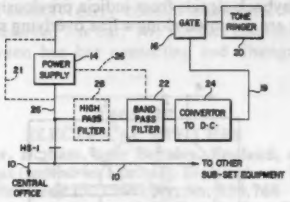
3,603,740

METHOD AND MEANS FOR RINGING A TELEPHONE SUBSET

Ronan Malcolm Cambridge, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Aug. 18, 1969, Ser. No. 850,894
Int. Cl. H04m *1/26, 1/50*
U.S. Cl. 179—84 UF **6 Claims**

A gate in the power circuit to the ringing device of a telephone subset is connected to the line from central office



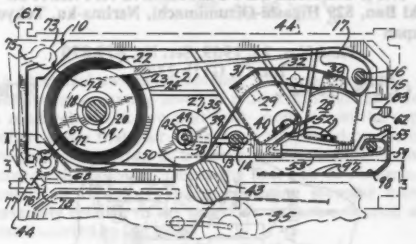
and is designed to be opened by signals within a predetermined frequency range appearing on said line.

3,603,741

TAPE CARTRIDGE ASSEMBLY HAVING LATCH, PRESSURE ROLLER, TRANSDUCERS AND TERMINALS INCORPORATED THEREIN

John W. Deed, Garden Grove, Calif., assignor to Master Specialties Company, Costa Mesa, Calif.

Filed Feb. 24, 1969, Ser. No. 801,449
Int. Cl. G11b *23/06;* **B65h** *17/20*
U.S. Cl. 179—100.2 Z **3 Claims**



A tape cartridge for an endless magnetic sound-reproducing tape. A record-playback head and an erase head are mounted in the cartridge and are electrically connected to terminals which extend partially along one side and the end of the cartridge. The endless tape extends around a pressure roller assembly which is biased to project from a side of the cartridge for engaging a drive capstan. The pressure roller assembly includes a self-aligning bearing to assure maximum contact with the capstan. Two cartridge holders can be mounted side-by-side to receive two cartridges for simultaneously driving two tapes from opposite sides of the capstan, and a number of the cartridge holders may be stacked for simultaneously driving a number of tapes from the single capstan. Each cartridge holder includes electrical contacts aligned to engage the cartridge terminals and a snap member for holding the cartridge in place. The cartridge further includes a handle to facilitate removal from the cartridge holder.

3,603,742

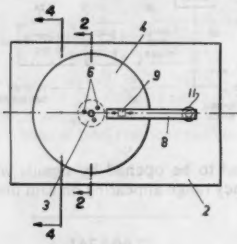
REPRODUCING SYSTEM UTILIZING ROUND FLEXIBLE MAGNETIZABLE RECORDING CARRIER FOILS

Eduard Schuller, Berlin, Germany, assignor to Telefunken Patentverivertungs G.m.b.H., Ulm/Danube, Germany

Filed Feb. 27, 1969, Ser. No. 802,858
Claims priority, application Germany, Feb. 29, 1968, P 15 74 491.9
Int. Cl. G11b *5/60, 5/82;* **G01d** *15/28*
U.S. Cl. 179—100.2 P **19 Claims**

A reproducing system for recording or playback of the type in which a stationary plate is mounted beneath a rotating round flexible foil type record and the stationary plate is formed with an upwardly arched surface with an elongated

crest which, when the record is at rest, underlies a diameter of the record. Transducer means which may be either means for placing recording indicia on the carrier, or means for forming playback signals from indicia previously recorded on the carrier are mounted along a line overlying said crest. The



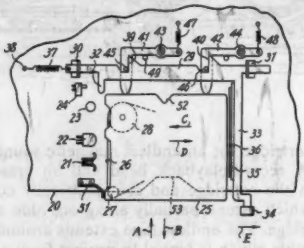
air pressure between the record and the arched surface is reduced by air currents generated during rotation of the record. This draws the flexible record into a stiffened curved position relative to the plate, and thus better positions the record relative to the transducer means.

3,603,743

TAPE-CARTRIDGE-POSITIONING APPARATUS

Itsuki Ban, 829 Higashi-Oizumimachi, Nerima-ku, Tokyo-To, Japan

Filed Nov. 25, 1969, Ser. No. 879,870
Int. Cl. G11b *23/04*
U.S. Cl. 179—100.2 Z **9 Claims**



A tape-cartridge-positioning apparatus for endless magnetic tape cartridge player, including a reciprocating lever member slidably supported on a deck in a player housing and biased by a tension spring in one direction, a stopper means retaining the reciprocating lever member at a first position, and a guide means guiding the cartridge.

The stopper means is operated by the cartridge which is laterally inserted in the player housing to release retention of the reciprocating lever member whereby the latter is moved from the first position to a second position by the bias of the spring. When the reciprocating lever member is moved from the first position to the second position, a portion of the reciprocating lever urges the rear edge of the cartridge to allow the cartridge is thus guided by he guide means and moved to positioned at the playing position.

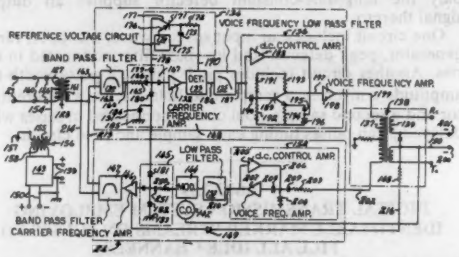
3,603,744

LINE TAP UNIT FOR TELEPHONE SYSTEM

Lester Q. Krasin, Dallas, and Clifford E. Greene, Fort Worth, both of, Tex., assignors to Superior Continental Corporation

Division of Ser. No. 491,106, Sept. 29, 1965, Pat. No. 3,475,561.
Filed July 7, 1969, Ser. No. 839,419
Int. Cl. H04b *3/24*; **H04m** *1/60*
U.S. Cl. 179—170.8 **9 Claims**

A line tap unit for use in combination with telephone facilities including a central office station having a plurality of central office terminals comprised of channel units with receiver and transmitter sections from which extend a two-conductor transmission line. The line tap units connected to each transmission line at locations remote from the central office terminal include a receiver section operable at the same frequency as a transmitter section of one central office channel unit and a transmitter section operable at another frequency which is the same frequency as a receiver section of the same central office channel unit. Each line tap unit has



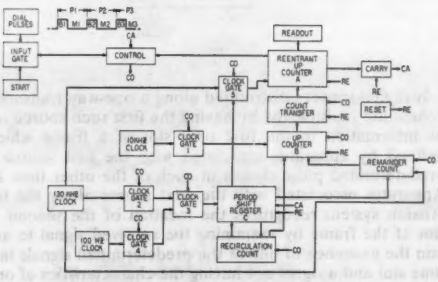
means for extracting low frequency power from the transmission line to operate its receiver and transmitter sections and coordination control means responsive to the signal received from its central office terminal for automatically adjusting the signal output of its transmitter section so that all signals arrive at a central office terminal at the same level. The coordination control means includes regulator means for comparing a received signal against a fixed reference and for producing a feedback signal proportional to the difference between the received signal and the fixed reference.

3,603,745

MEASUREMENT OF AVERAGE DUTY CYCLE

Henry Mann, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 24, 1969, Ser. No. 879,282
Int. Cl. H04m *3/08*
U.S. Cl. 179—175.2 A **16 Claims**



Digital technique is used to control two clock pulse counters and a shift register for measuring an approximation of the average percent break or pulsing speed over a series of telephone dial pulse periods. For percent break, up-counter B serially counts pips of frequency $100f$ during the sum of nine break intervals and the nine's complement (one's complement in the binary form) is placed in reentrant up-counter A. The shift register accumulates pips of frequency f during the entire time of nine pulse periods. Dividing circuitry causes the shift register count to recirculate while being serially added to the count in A. Recirculation is stopped when A exceeds its capacity (from capacity to zero count). The number of recirculations is registered as a percent. Fractional control circuitry takes into account any remainder in the shift register. Visual display is provided of the answer in percent. For pulsing speed, a prescribed count is placed in up-counter A and the accumulated shift register count cor-

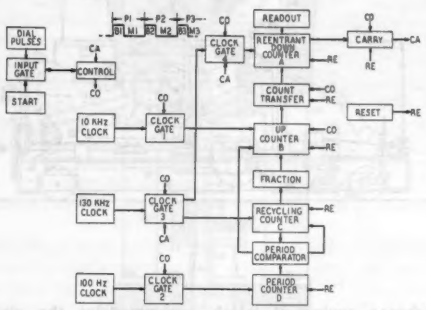
responding to the nine pulse periods is used as in percent break to provide an answer approximating the pulsing speed.

3,603,746

MEASUREMENT OF AVERAGE DUTY CYCLE

Robert B. Heick, Eatontown, and Henry Mann, Holmdel, both of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 24, 1969, Ser. No. 879,498
Int. Cl. H04m 3/08
U.S. Cl. 179—175.2 A 13 Claims



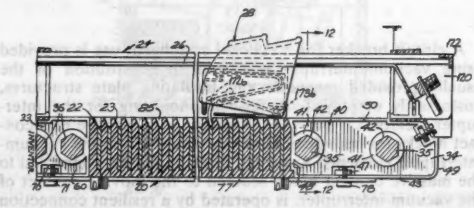
Digital technique is used to control four clock pulse counters for measuring an approximation of the average percent break or the pulsing speed over a series of telephone dial pulse periods. For percent break, up-counter B serially counts pips of frequency 100*f* during the sum of nine break intervals, the total B count is placed as the same count in reentrant down-counter A and counter B is cleared. Counter D accumulates pips of frequency *f* during the entire time of nine pulse periods. Dividing circuitry causes down-counting in counter A and up-counting in counter C under the control of a high-speed clock. Counter C is recycled each time it accumulates a count equal to the count in counter D. Down-counting in A and up-counting in C are stopped when A down-counts from zero to capacity count. The number of recyclings of counter C is registered in the cleared counter B as a percent. Fractional control circuitry takes into account any remainder in counter C. Visual display is provided of the answer in percent. For pulsing speed, a prescribed count is placed in down-counter A and the accumulated count in counter D corresponding to the nine pulse periods is used as in percent break to provide an answer approximating the pulsing speed.

3,603,747

CORDLESS ELECTRIC CROSS-CONNECT PANEL WITH IMPROVED MOVABLE CONTACT BRUSH ASSEMBLY

Ariel R. Davis, 3476 Fleetwood Drive, Salt Lake City, Utah

Continuation-in-part of application Ser. No. 660,988, Aug. 16, 1967. This application Dec. 8, 1969, Ser. No. 883,099
Int. Cl. H01h 9/00, 15/00; H02b 1/04
U.S. Cl. 200—1 R 25 Claims



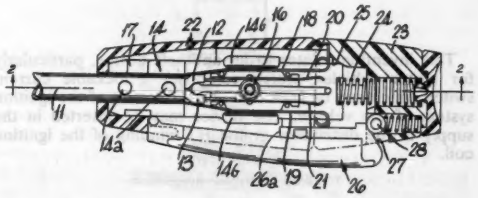
A cross-connect or patch panel has a multiplicity of long bus bars interleaved with insulating strips and parallel side support beams. Transverse members hold the bus bars, insulating strips and beams together. Cross-connect modules are mounted on the support beams to span the bus bars and strips and to slidably carry contact assemblies for engagement with a selected bus bar. The contact assemblies are actuatable between bus bar contacting and disengaging positions.

3,603,748

ELECTRICAL SWITCHES

Edward Cryer, Higham, near Burnley, England, assignor to Joseph Lucas (Industries Limited), Birmingham, England

Filed June 19, 1969, Ser. No. 834,768
Claims priority, application Great Britain, June 28, 1968, 30,902/68
Int. Cl. H01h 9/26
U.S. Cl. 200—5 B 10 Claims



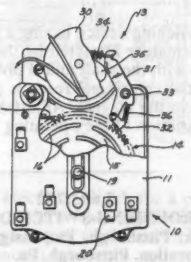
An electrical switch comprising a support member, conveniently the operating lever of a direction indicator switch of a road vehicle. A two part body mounted on the support member, and a first pair of contacts supported by the body. Surrounding the body is a sleeve which is slidable axially relative to the body to operate the first pair of contacts, and mounted on the sleeve is an operating member movable transversely relative to the sleeve to operate a second set of contacts carried by the body.

3,603,749

SUBINTERVAL TIMER DRIVE SYSTEM

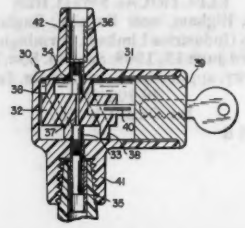
Gordon Jerry Davis, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed June 15, 1970, Ser. No. 46,142
Int. Cl. H01h 7/08, 43/10
U.S. Cl. 200—38 C 12 Claims



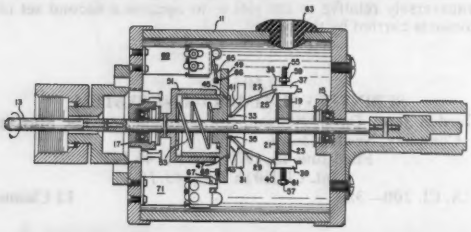
A timer drive system including a pair of cam means incrementally and differentially advanceable by a single driven ratchet pawl. The pair of cam means includes ratchet means engageable by the ratchet pawl in a sequence effective for incrementally advancing alternately one cam means and then both cam means so that the cam means are effectively driven at different rates but are maintained synchronized by the common driven ratchet pawl. One of the cam means is operable for effecting subinterval switching.

3,603,750
ANTITHEFT DEVICE FOR MOTOR VEHICLES
Walo Beier, Hegenheimermattweg 42, Allschwil, Switzerland
Filed Oct. 2, 1969, Ser. No. 863,246
Claims priority, application Switzerland, Oct. 3, 1968, 14783/68
Int. Cl. H01h *27/00*
U.S. Cl. 200—44 **13 Claims**



This invention relates to an antitheft device, particularly for motor vehicles, which comprises a lockable current switch which can be built into the HT circuit of the ignition system of the vehicle. The device may be inserted in the supply to the distributor or the HT winding of the ignition coil.

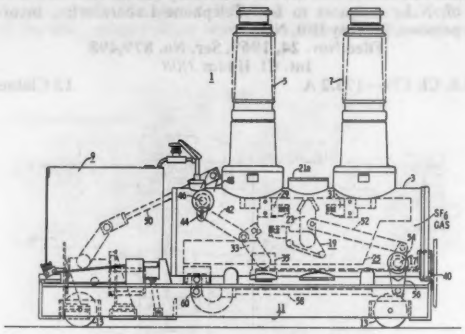
3,603,751
MAGNETIC CENTRIFUGAL SWITCH
Peter B. Smith, Monroe, Conn., assignor to Dynamics Corporation of America, New York, N.Y.
Filed July 22, 1969, Ser. No. 843,404
Int. Cl. H01h *35/10*
U.S. Cl. 200—80 **8 Claims**



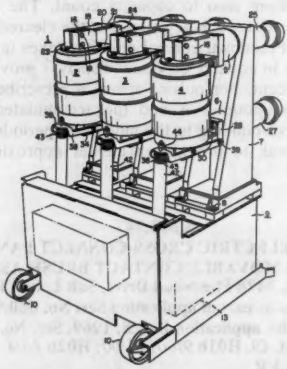
Centrifugal switching device having a magnet rotating with a shaft and an armature attracted by the magnet. The armature also rotates with the shaft and is pivoted so as to operate a switch when the centrifugal force is great enough to free the armature from the magnet. Adjustable nuts are provided to allow for a variation of the operating radius of the mass of the armature.

3,603,752
GROUNDING-SWITCH DEVICE
Russell E. Frink, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Jan. 15, 1970, Ser. No. 3,182
Int. Cl. H01h *33/00*
U.S. Cl. 200—148 R **14 Claims**

A grounding switch device is provided capable of utilizing the same type of mechanism as a circuit breaker, and adapted for substitution for the circuit breaker structure in metal-clad switchgear equipment. Each pole-unit is provided with a selector switch capable of being manually positioned in either one of two positions, for grounding either the line terminal or the bus terminal, and, additionally, the pole-unit includes a grounding switch capable of being actuated by the quick-acting circuit breaker type of operating mechanism. The grounding device is of the same dimensions and can be rolled into the same cell structure of the metal-clad switchgear equipment which accommodates the circuit breaker unit.



3,603,753
METALCLAD SWITCHGEAR USING VACUUM INTERRUPTER ELEMENTS
Russell E. Frink, Forest Hills, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Feb. 28, 1968, Ser. No. 709,013
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **8 Claims**



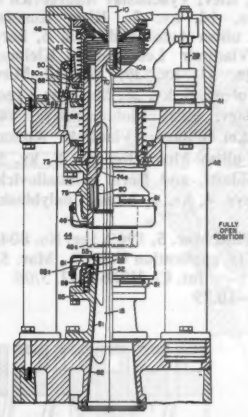
A circuit breaker for metalclad switchgear use is provided using vacuum-interrupter elements in substitution of the usually provided magnetic and insulating plate structures, customarily employed. A resilient mounting for the interrupter elements is provided, together with massive end contact blocks for heat dissipation generated within the vacuum-interrupter elements. A pivoted operating lever, connected to the massive contact block secured to the moving contact of the vacuum-interrupter, is operated by a resilient connection to the insulating operating rod of the circuit breaker. Because of the reduced dimensions, the cubicle dimensions may be drastically reduced, if desired.

3,603,754

CONTACT STRUCTURE FOR HIGH-VOLTAGE CIRCUIT INTERRUPTER WITH LINER COMPONENTS

Frank L. Reese, Monroeville, and Hayes O. Dakin, Jr., Irwin, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 6, 1970, Ser. No. 9,373
Int. Cl. H01h 33/02
U.S. Cl. 200—148 R 10 Claims



A separable contact structure is provided for a high-voltage compressed-gas circuit interrupter involving at least one of the contacts being tubular to provide a gas flow therethrough, and having a liner component therein. To facilitate movement of the terminal end of the arc, a relatively thin tubular member is inserted interiorly of the hollow contact, and, by electrically connecting the same to the inner anterior end of the hollow contact, the magnetic field situation is such that the terminal end of the arc is encouraged to move axially along the relatively thin tubular liner member to thereby effect considerable elongation of the established arc, and thereby to effect the extinction of the same by a more effective gas flow condition.

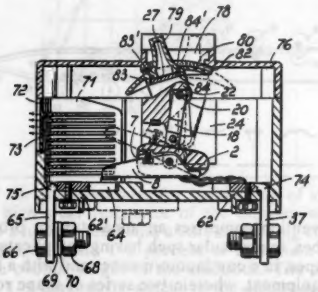
As a further extension of this same concept, a cooperable tubular contact structure may be provided, through which gas also exhausts, and a similar relatively thin tubular liner member may also be associated therewith to act in a similar manner.

3,603,755

POWER ELECTRIC SWITCH

Pierluigi Ranzanigo, Via Violino di Sopra 67, Brescia, Italy

Filed Apr. 9, 1969, Ser. No. 814,667
Claims priority, application Italy, Apr. 13, 1968, 829866/68
Int. Cl. H01h 9/08, 3/46
U.S. Cl. 200—153 G 8 Claims



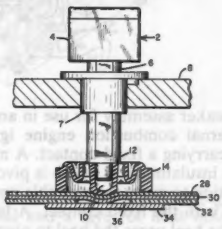
An electric switch comprising a trip mechanism including tiltable contact elements, support means for the tiltable contact elements and operating means for the latter connected to each other to form a single unit which is insertable through the open end of a housing into the latter to cooperate with stationary contacts in the bottom wall of the housing, and the latter is provided with a cover for closing the open end. The cover is formed with an opening through which one end portion of the operating means extends in a sealed manner when the trip mechanism is inserted in the housing.

3,603,756

SNAP ACTION SWITCH

Frank J. Carpentier, and Stanley J. Lins, both of Minneapolis, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 29, 1970, Ser. No. 6,818
Int. Cl. H01h 3/12
U.S. Cl. 200—159 B 2 Claims



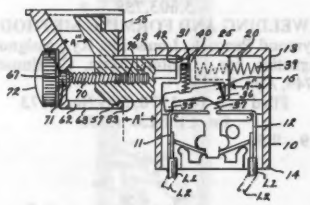
An improved electrical switching arrangement wherein a diaphragm-type switch element is operated by a plunger mechanism having a novel molded elastomer return spring operatively associated with the plunger element for providing "snap action."

3,603,757

ADJUSTABLE SWITCH DEVICE

Edward V. Sahrbacker, Brecksville, Ohio, assignor to Lucerne Products, Inc., Hudson, Ohio

Filed Sept. 18, 1969, Ser. No. 859,039
Int. Cl. H01h 9/06
U.S. Cl. 200—157 6 Claims



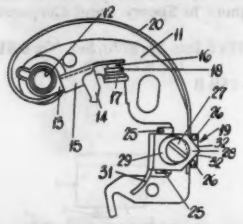
A trigger-operated electrical switch for a portable electric motor-driven tool to control the application of electrical energy from an energy source to the motor. The switch includes stationary contaCt elements and a stationary resistance element connected into an electrode circuit. The switch also includes a contact carrier having a plurality of movable contact elements which coact with the stationary contact elements and the resistance element to variably control the application of the electrical energy to the motor. A manually actuatable trigger handle is adjustably connected to the contact carrier to enable selective manual actuation thereof. The trigger handle is longitudinally adjustable on the contact carrier to enable the operator to preselect the amount the movable contaCts may be moved relative to the stationary contact elements and resistance element and thus control the speed of the motor.

3,603,758

IMPROVED CONTACT BREAKER ASSEMBLIES FOR USE IN INTERNAL COMBUSTION ENGINE IGNITION SYSTEMS

William Lawrence Fry, Haughton; Antony Peter Royle, Solihull, and Peter Darbyshire, Birmingham, all of, England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 25, 1969, Ser. No. 879,824
Claims priority, application Great Britain, Dec. 6, 1968, 58154/68
Int. Cl. H01h 3/00
U.S. Cl. 200—166 CT 4 Claims



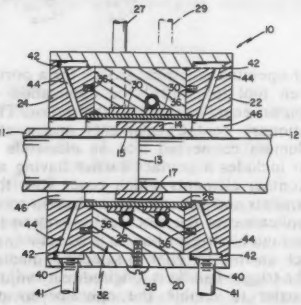
A contact breaker assembly for use in an ignition distributor for an internal combustion engine ignition system includes a plate carrying a fixed contact. A movable contact is mounted on an insulating heel which is pivotable for a movement in a direction to move the movable contact into and out of engagement with the fixed contact. A leaf spring secured at one end to the heel urges the heel to pivot in a direction to engage the movable contact with the fixed contact. The end of the leaf spring remote from the heel is anchored with respect to the plate, and the spring constitutes part of a conductive path to the movable contact. Said other end of the spring is fixed relative to the plate by means of an insulating block which is carried by the plate. The block is shaped to receive said other end of the leaf spring, and is also shaped to receive a conductive terminal in engagement with the leaf spring. A clamping screw is provided for clamping the terminal in engagement with the block and the leaf spring, so that the movable contact is electrically connected to the terminal through the leaf spring. The clamping screw clamps the end of the leaf spring in position, by virtue of engagement of the terminal and the leaf spring, and the arrangement of the terminal and the clamping screw is such that the terminal can be disengaged from the spring and the block without removing the terminal screw completely from the block.

3,603,759

WELDING AND FORMING METHOD

George Raymond Peacock, Louisville, Ky., assignor to Industrial Magnetics, Inc., Canton, Mass. Continuation of Ser. No. 717,749, Apr. 1, 1968

Filed Jan. 14, 1970, Ser. No. 4,173
Int. Cl. B23k 13/00
U.S. Cl. 219—9.5 20 Claims



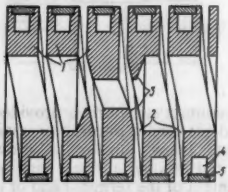
A forming method in which members are forced together at an interface by causing parallel currents to flow in an adjacent conductors, thereby forcing the conductors toward each other in a direction generally normal to the interface.

3,603,760

APPARATUS FOR EFFECTING THE MAGNETIC-IMPULSE WELDING AND PRESSURE WORKING OF METALS, PREFERABLY FOR WELDING TUBULAR-SHAPED PARTS

Konstantin Konstantinovich Khrenov, ulitsa Cheljuskintsev, 15, kv. 11, Kiev; Vyacheslav Andreevich Chudakov, ulitsa Bolnichnaya, 14, kv. 2., Kiev; Konstantin Vasilievich Stroganov, ulitsa Avtozavodskaya, 6, korpus A, kv. 202, Moscow; Vladimir Leonidovich Kleiman, ulitsa Chernyshevskogo, 11, kv. 29, Mikhail Mironovich Fishkis, Zvezdny Bulvar, 5, kv. 28, Moscow; Vyacheslav Mikhailovich Nikolaev, ulitsa Molodezhnaya, 14, kv. 71, Miass Chelyabinskoi oblasti; Vladimir Kommunarovich Kalnishevsky, ulitsa Moldezhanaya, 8, kv. 50, Miass Chelyabinskoi oblasti, and Boris Mikhailovich Maltsev, ulitsa Dobroljubova, 4, kv. 6, Miass Chelybinskoi oblasti, all of, U.S.S.R.

Filed Mar. 5, 1969, Ser. No. 804,505
Claims priority, application U.S.S.R., Mar. 5, 1968, 1220255
Int. Cl. H05b 9/02, 5/00
U.S. Cl. 219—10.79 5 Claims



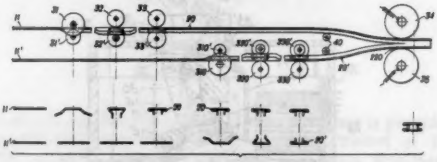
An apparatus for magnetically welding metals comprises an inductor. The inductor includes means defining a plurality of turns axially and annularly spaced from one another. The inductor includes an intermediary portion of the increased thickness defining a welding zone. The intermediary portion is annular and acts to increase the concentration of a magnetic field applied in the welding zone. The turns have respective diameters varying successively toward the welding zone.

3,603,761

APPARATUS FOR PRODUCING FOLD FLANGE TUBES

Alfred Wogerbauer, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria Division of Ser. No. 651,836, July 7, 1967, Pat. No. 3,545,496

Filed Jan. 7, 1970, Ser. No. 1,105
Claims priority, application Austria, Aug. 9, 1966, A-7605/66
Int. Cl. B23k 11/02
U.S. Cl. 219—59 3 Claims



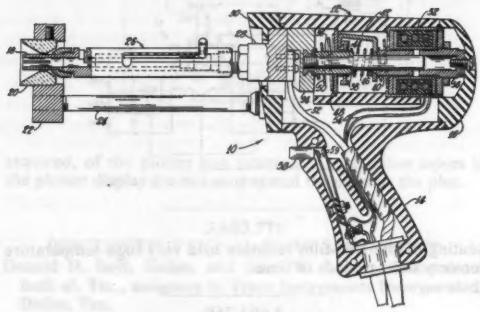
The invention comprises an apparatus for producing fold flange tubes, in particular such having complicated cross-sectional shapes, in a continuous manner and with a minimum of tooling equipment, wherein two series of shape rolling stands arranged in staggered relationship in a vertical plane for the formation of component sections, a device for vertically approaching the component sections so formed, and a welding machine for joining the component sections are provided.

3,603,762

STUD-WELDING TOOL AND STUD-LOADING DEVICE THEREFOR

Steve Spisak, Elyria, Ohio, assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 358,736, Apr. 10, 1964, Pat. No. 3,525,846.
Filed May 5, 1966, Ser. No. 547,977
Int. Cl. B23k 9/20
U.S. Cl. 219—98 1 Claim



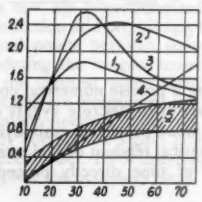
A system for feeding small studs to a chuck of a stud-welding tool is provided. The stud-welding tool has a chamber behind the chuck into which the studs are fed. A plunger then moves the studs from the chamber into the chuck from the rear.

3,603,763

ELECTRODE FOR BUILDING UP OF STEEL ARTICLES

Jury Arsenievich Juzvenko, bulvar Lesi Ukrainki, 2, kv. 59, Kiev; Tamara Vladimirovna Lanina, ulitsa Likhacheva, 8b, kv. 7, Kiev; Vasily Pavlovich Shimanovsky, ulitsa Klevsky spusk, 4, kv. 38, Kiev; Vasily Antonovich Gavrish, ulitsa Kapetanovskaya, 6, kv. 10, Kiev; Mark Antonovich Paschenko, ulitsa Ezhena Potie, 9, kv. 97, Kiev; Alexandr Vasilievich Melnik, ulitsa Lenina, 9, kv. 11, Kiev; Igor Sergeevich Zhurkovsky, ulitsa Kossiora, 6, kv. 29, Dnepropetrovsk, and Moisei Isaakovich Vaksin, ulitsa Frunze, 11, kv. 3, Dnepropetrovsk, all of, U.S.S.R.

Filed June 24, 1969, Ser. No. 835,974
Claims priority, application U.S.S.R., June 28, 1968, 1254046
Int. Cl. B23k 35/22
U.S. Cl. 219—146 7 Claims



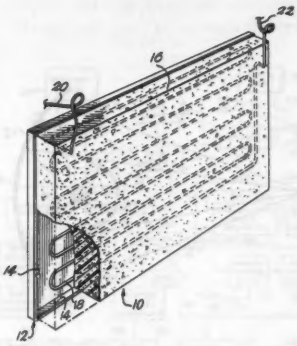
Powdered carbide electrodes for building up of steel articles having high wear resistance of the built-up metal are composed of a nickel sheath and a core containing chromium carbides, e.g. Cr_3C_2 and 1–3 percent of aluminum powder, based on the overall weight of the electrode. The core may also contain 1–3 percent by weight of the electrode of sodium fluosilicate to eliminate porosity in the built-up layer and chromium boride, boron carbide or boron-chromium alloys to strengthen the matrix (binder) of the deposited metal.

3,603,764

ELECTRIC HEATING PANEL

Hugh Martin, R.R. 1, Box 192, New Salisbury, Ind.

Filed Sept. 11, 1969, Ser. No. 857,126
Int. Cl. H05b 1/00
U.S. Cl. 219—213 7 Claims



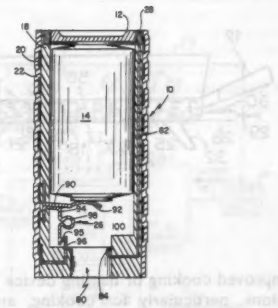
An electric prefinished heating panel having a layer of heat conducting material and a layer of heat insulating material with an electric heating element sandwiched therebetween. The heating panel is used with conventional acoustical ceiling tiles to form a ceiling of a room with the heating panels interspersed among the acoustical tiles to provide the desired pattern of heat.

3,603,765

ELECTRICALLY HEATED HAIR ROLLER WITH SELF-CONTAINED POWER SOURCE

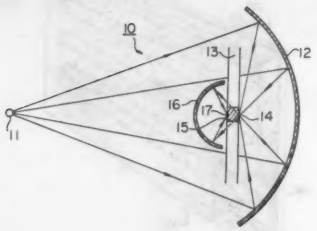
Donald L. Underwood, Northbrook, Ill., assignor to The Gillette Company, Boston, Mass.

Filed Oct. 22, 1969, Ser. No. 868,509
Int. Cl. A45d 2/36; H05b 3/00; H01m 45/04
U.S. Cl. 219—222 8 Claims



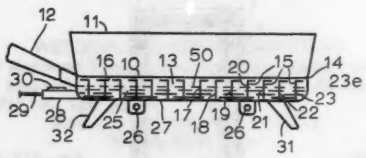
A hollow tubular hair roller about which hair may be wound incorporates a resistive heating element in its tubular wall structure. A battery, which may be rechargeable, is supported within the hollow interior of the roller and connected to the heating element. A zone of heat insulation at least one-sixteenth inch deep and having a thermal conductivity less than 0.003 cal./(sec.) (cm.²) (° C./cm.) is provided between the resistive heating element and the battery. The zone of insulation may be a tube of solid or foamed synthetic polymer or an airgap through which battery supporting nibs extend.

3,603,766
ARC-IMAGE ZONE-REFINING FURNACE
Yoshihiro Kino, and Yasuhiko Nakayama, both of Kodoma, Osaka, Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan
Filed Sept. 15, 1969, Ser. No. 857,841
Int. Cl. H05b 7/18
U.S. Cl. 219—349 1 Claim



An arc-image zone-refining furnace having an auxiliary spherical mirror located opposite to an ellipsoidal mirror. Provision of the auxiliary spherical mirror makes possible not only the processing of a material in the form of a bar having a large diameter but also the reduction in the speed required to rotate the bar.

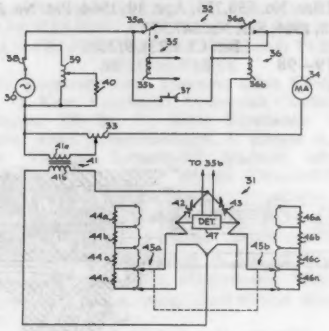
3,603,767
ISOTHERMAL COOKING OR HEATING DEVICE
Edward A. Scicchitano, Towson, Md., assignor to Dynatherm Corporation, Cockeysville, Md.
Filed Sept. 3, 1969, Ser. No. 854,893
Int. Cl. F27d 11/02
U.S. Cl. 219—439 10 Claims



An improved cooking or heating device adapted for many applications, particularly for cooking, and useful to heat many substances, as in the chemical industry. The device is isothermal and incorporates a heat pipe principal.

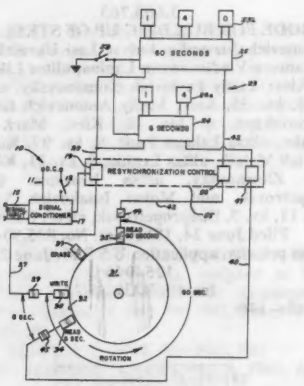
3,603,768
THIN-FILM RESISTOR ADJUSTMENT
John W. Ireland, and James C. Holloway, both of Canoga Park, Calif., assignors to The Bunker-Ramo Corporation, Stamford, Conn.
Division of Ser. No. 410,439, Nov. 12, 1964, Pat. No. 3,457,636.
Filed May 26, 1969, Ser. No. 852,132
Int. Cl. H05b 1/02
U.S. Cl. 219—499 10 Claims

An apparatus for adjusting the resistance values and temperature coefficients of resistance of thin-film resistors within very close tolerances. The adjustment is achieved through



heating of the thin-film resistors to a very high temperature for very short periods of time.

3,603,769
RATE DETECTING APPARATUS
Donald H. Malcolm, Minneapolis, Minn., assignor to Bio Data, Inc., Minneapolis, Minn.
Filed Nov. 3, 1969, Ser. No. 873,246
Int. Cl. G06m 3/06
U.S. Cl. 235—92 DP 3 Claims

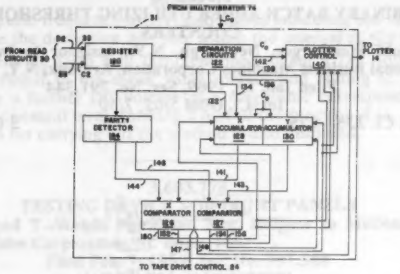


An apparatus giving a precise numerical count of the rate of occurrence of a series of discrete events electrically detected such as of a human pulse rate embodying the use of a counter giving a numerical readout of said rate of occurrence for a fixed interval of time directly preceding the count given.

3,603,770
TAPE BUFFER SYSTEM FOR INCREMENTAL PLOTTER
Edward R. Reins, Jr., Monterey, Calif., assignor to Trans-Controls, Inc., Pacific Grove, Calif.
Filed Jan. 6, 1969, Ser. No. 789,168
Int. Cl. G06f 13/08, 7/00
U.S. Cl. 235—151 3 Claims

Magnetic tape buffer equipment for use between a digital computer and an incremental plotter, including a tape loop, storage and forward-reverse drive therefor, writing and read-

ing stations and error-checking circuits operating in a system which provides for periodic checks and correction, if



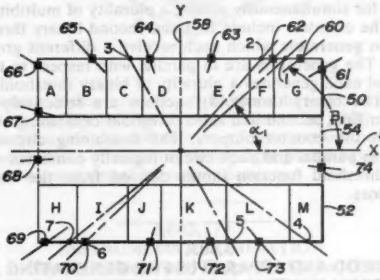
required, of the plotter pen position in order that errors in the plotter display are not propagated throughout the plot.

3,603,771

INPUT/OUTPUT SIGNAL POINT ASSIGNMENT

Donald D. Isett, Dallas, and John W. Lomax, Richardson, both of, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 15, 1969, Ser. No. 841,858
Int. Cl. G06f *15/20;* **H01l** *1/24*
U.S. Cl. 235—151 **9 Claims**



Active components, such as logic gates or flip-flops, formed in a semiconductor substrate are interconnected to input/output bonding pads and other active components in a circuit array in four separate operations. First, after arranging the active components in rows, signal points of all components in one row are interconnected by considering the longest interconnection and proceeding to the shortest. Next, component signal points between rows are interconnected again by considering the longest interconnecting path and proceeding to the shortest path. Third, input/output component signal points are assigned to input/output conductive pads. Finally, interconnecting paths are completed between the input/output component signal points and an assigned pad in a numbered order. Each operation uses a distinct algorithm to complete the necessary steps.

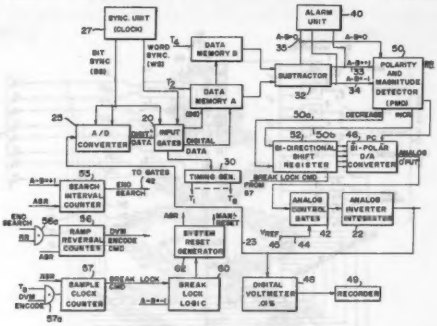
3,603,772

ANALOG-TO-DIGITAL CONVERTER ANALYZING SYSTEM

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Willis W. Allen

Filed Sept. 9, 1969, Ser. No. 856,282
Int. Cl. H03k *13/32*
U.S. Cl. 235—153 **17 Claims**

A system in which a variable and measurable analog signal, such as a voltage, is supplied to an A/D converter, which is being analyzed. Successive digital outputs, such as numbers, of the converter are determined and temporarily stored for comparison purposes. Based on the relative values of the successive numbers, the input voltage to the converter is varied, both in polarity and in magnitude, until a voltage is reached, which when applied to the converter there exists a 50 per-



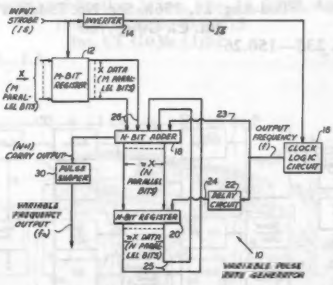
cent probability that the output number is one of two adjacent numbers. The voltage magnitude, or simply the voltage, is recorded to represent one indecision zone. Thereafter, the input voltage is varied to determine another indecision zone between a selected output number and another number, different therefrom by one.

3,603,773

DIGITAL PULSE RATE GENERATOR

Joseph Carlstein, East Meadow, N.Y., assignor to Vernitron Corporation, Great Neck, N.Y.

Filed Aug. 28, 1969, Ser. No. 853,718
Int. Cl. G06f *5/06;* **H03k** *13/256*
U.S. Cl. 235—154 **9 Claims**

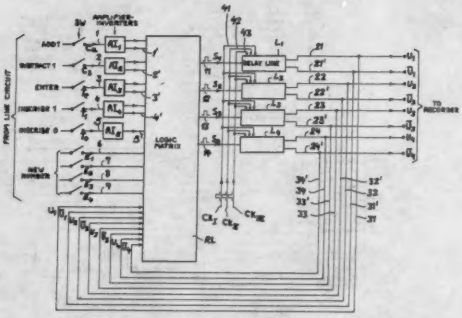


In a variable pulse rate generator, a digital number is applied as parallel bits to a first bit register which stores and then transfers the bits to a bit adder under control of a clocked logic circuit. The bit adder applies its parallel bit output to a second bit register which feeds the bits back to the adder for accumulation. Periodically the adder applies a most significant bit to a pulse shaper thus creating a variable frequency output proportional to the value of the original digital number.

3,603,774
SYSTEM FOR THE MODIFICATION OF DATA STORED IN RECIRCULATING DELAY LINES

Giorgio DeVarda; Saverio Martinelli, and Aldo Perna, all of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed June 10, 1968, Ser. No. 735,606
Claims priority, application Italy, June 9, 1967, 17,009/68
Int. Cl. G06f 7/50
U.S. Cl. 235—168 11 Claims

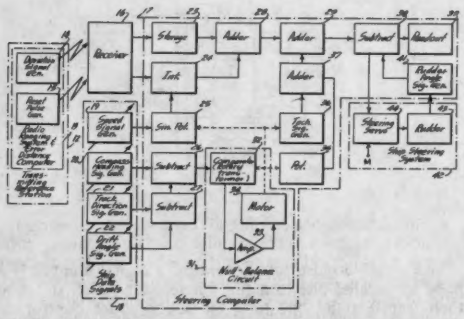


In a telecommunication system of the time-sharing type wherein several calls are concurrently conducted over a common line circuit by means of interleaved message signals recurring in a predetermined order, command pulses relating to the several calls are sequentially directed to the input of a register with several parallel memory stages each including a delay line whose delay time encompasses a number of pulse cycles equal to the maximum number of calls to be accommodated simultaneously by the line circuit. Digital pulses traveling along each memory stage are continuously fed back from the output to the input thereof for reinscription until modified by a command signal applied to all the memory stages through a logic matrix for carrying out such operations as "enter 1," "enter 0," "inscribe new number," "add 1" and "subtract 1."

3,603,775
STEERING COMPUTER AND INDICATOR

Richard T. Galloway, and David H. Brunk, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 21, 1968, Ser. No. 754,268
Int. Cl. G06g 7/66
U.S. Cl. 235—150.26 9 Claims

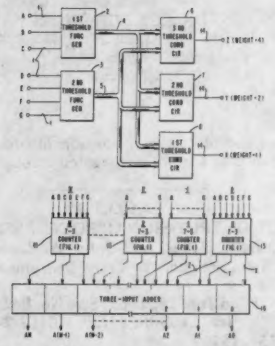


A steering control system for automatically navigating a vehicle along a predetermined course having a reference station for supplying distance and timing data signals, signal generators for supplying vehicle data signals, a receiver, and a computer for computing the steering mechanism actuations necessary to make said vehicle maintain the aforesaid predetermined course in response to said data signals.

3,603,776
BINARY BATCH ADDER UTILIZING THRESHOLD COUNTERS

Arnold Weinberger, Newburgh, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,344
Int. Cl. G06f 5/02, 7/50
U.S. Cl. 235—175 5 Claims

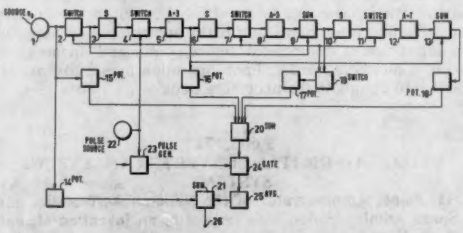


Disclosed are counters for counting inputs in terms of a fewer number of outputs. The counters are useful in batch adders for simultaneously adding a plurality of multibit numbers. The counters include first and second binary threshold function generators which each receive a different group of inputs. The generators are in parallel with respect to the inputs and each generates a plurality of binary threshold functions. The binary threshold functions are selectively combined in first, second and third threshold combining circuits to form the counter outputs. The combining circuits are placed in parallel and each circuit logically combines one or more threshold function inputs derived from the function generators.

3,603,777
METHOD AND APPARATUS FOR GENERATING AN ELECTRICAL SIGNAL, REPRESENTING A VALUE OF A FUNCTION OF AN INDEPENDENT VARIABLE

Gunnar Axel Kihlberg, Sollentuna, Sweden, assignor to Jungner Instrument Aktiebolaget, Stockholm, Sweden

Filed Apr. 2, 1969, Ser. No. 812,756
Claims priority, application Sweden, Apr. 25, 1968, 5600/68
Int. Cl. G06g 7/26
U.S. Cl. 235—197 5 Claims



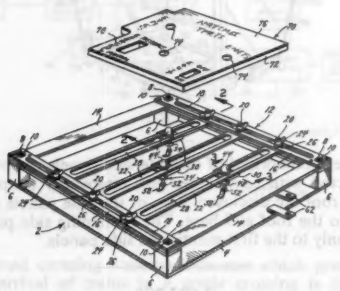
A method of, and apparatus for, generating an electrical signal representing a value of a function of an independent variable. The method comprises the steps of generating an electrical signal, with a period T, representing the variations of the derivative $df(x)/dx$ of the function $f(x)$ within an inter-

val $x_a \leq x \leq x_b$ including the value x_1, and deriving from said signal a pulse-duration modulated signal consisting of pulses having a duration of

$$\frac{x_1 - x_a}{x_b - x_a} \cdot T$$

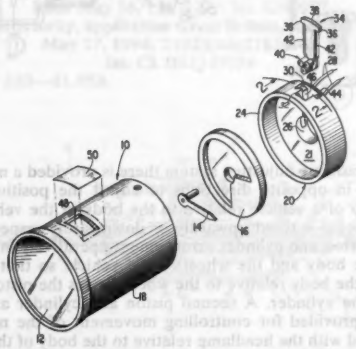
and a pulse frequency of $1/T$, said pulses indicating the variations in the derivative $df(x)/dx$ within the interval $x_a \leq x \leq x_1$ and deriving from said last-mentioned signal a DC voltage proportional to the mean value thereof and adding to this voltage a further DC voltage of a magnitude corresponding to any constant term, forming a part of the function $f(x)$. Apparatus for carrying out the method is also disclosed.

3,603,778
TESTING DEVICE FOR LIGHT PANELS
Raymond T. Walsh, Florissant, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Feb. 7, 1969, Ser. No. 797,508
Int. Cl. F21v *21/14, 33/00*
U.S. Cl. 240—2 **12 Claims**



A testing device for testing light panels having bulb receiving apertures. The testing device includes bulbs which fit into the apertures and are shiftable on a frame so that the testing device is capable of accommodating light panels having their bulb apertures arranged in varying patterns.

3,603,779
INSTRUMENT ILLUMINATION
Edgar J. Horne, Perkasie, and Ralph C. Spohn, Greenlane, both of, Pa., assignors to Ametek, Inc., New York, N.Y.
Filed June 5, 1969, Ser. No. 830,785
Int. Cl. G01d *11/28*
U.S. Cl. 240—2.1 **3 Claims**

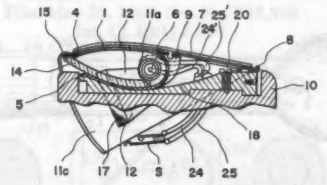


An instrument casing, particularly for aircraft, is provided with a removable unit carrying a printed circuit element carrier having one or more light bulbs adjacent its end and insertable through a suitably shaped slot in the casing element. The printed circuit carrier is guided in such radial movement and provided with stop means to position the same.

3,603,780
ARTIFICIAL TREE STRUCTURE
Kenneth C. Lu, 134 York Dr., Piedmont, Calif.
Continuation-in-part of application Ser. No. 636,858, May 8, 1967, now abandoned. This application Jan. 26, 1970, Ser. No. 5,839
Int. Cl. A47g *33/16, 33/06*
U.S. Cl. 240—10 R **5 Claims**

Improved structure for an artificial tree such as a Christmas tree having a hollow trunk with hollow sleeved limbs pivotally mounted on the trunk at decreasing distances therefrom toward the tree top for folding of the structure into minimized volume. Electrical wiring extending from limbs through the tree trunk provides an integral lighting system and adds structural rigidity while limb covers provide maximized realistic appearance.

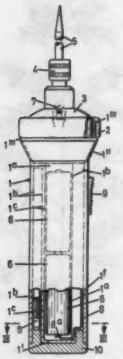
3,603,781
FOLDABLE STROBO DISCHARGE FLASH SYSTEM
Tatsuo Kobayashi, Handa Kaizuka-shi, Osaka-fu; Yoshifusa Fujii, Mori Kaizuka-shi, Osaka-fu, and Hiroshi Ueda, Nara-shi, all of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Apr. 15, 1969, Ser. No. 816,263
Claims priority, application Japan, Apr. 16, 1968, Apr. 22, 1968, 43/25356; 43/26615
Int. Cl. G03b *15/02*
U.S. Cl. 240—1.3 **7 Claims**



A foldable strobo discharge flash system comprising a cylindrical strobo discharge tube and a reflecting mirror forming a cylindrical curved surface which has the discharge tube at its focal line and is made of flexible and elastic metal plate so as to be folded compactly. One of the edges of the flexible reflecting plate is set on a movable frame member supporting the strobo discharge tube and the curvature of the reflecting plate is varied in coordinating with the operation of the movable frame member. At a full open state of the movable frame member the reflecting plate becomes a reflecting mirror for the strobo discharge tube and at a closed state the

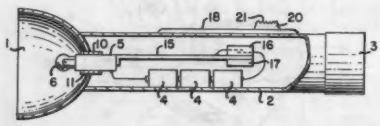
reflecting plate is folded flat. Further, the power switch of the strobo discharge tube is turned on or off in coordinating with the operation of the movable frame member.

3,603,782
COMBINED TOOL HOLDER AND FLASHLIGHT
Herbert Wortmann, Ludenscheid, Germany, assignor to Carl von der Crone & Co., Ludenscheid, Germany
Filed Apr. 2, 1969, Ser. No. 812,779
Claims priority, application Germany, Apr. 13, 1968, Nov. 14, 1968, C 17 375; P 18 08 818.1
Int. Cl. B25g *1/08*; F21l *3/00*, *15/00*
U.S. Cl. 240—6.46 4 Claims



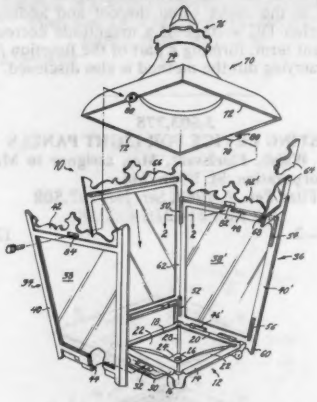
In a combination of a tool holder and a flashlight, the flashlight proper illuminates the area in which work is being performed by the particular tool inserted into the tool holder. Various tools may be inserted into the tool holder. To simplify operation of such a composite device the casing of the flashlight is adapted to perform two functions, i.e. to receive the dry cells for operating the flashlight, and to store additional tools which may be inserted selectively into the tool holder.

3,603,783
LANTERN HAVING MAGNETIC LAMP FOCUSING AND SWITCHING
Arthur G. Schwartz, 1119 Smyrna Court, Sunnyvale, Calif.
Filed Mar. 27, 1970, Ser. No. 23,379
Int. Cl. F21l *7/00*
U.S. Cl. 240—10.69 6 Claims



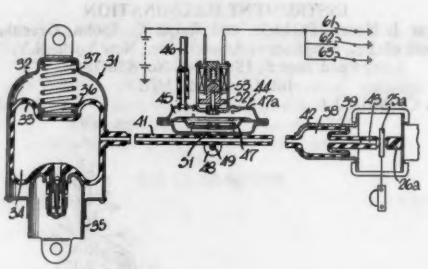
Lamp excitation, deexcitation, focusing and defocusing is provided in a lantern assembly by means of a single externally controlled magnet which coacts with an internal hardwired hermetically sealed magnetic reed switch to control lamp excitation and an internal magnetic member for providing lamp position adjustment for infinite focus control. Under high current conditions a pushbutton switch may be a desired substitute for the reed switch. Suitable environmental conditions may further permit the use of slide or wiper contacts for lamp excitation control where good electrical contact between exposed metal surfaces can be readily maintained.

3,603,784
LANTERN
Carl Wellhofer, Glenside, Pa., assignor to Walter Kidde & Co., Inc., Clifton, N.J.
Filed Nov. 12, 1968, Ser. No. 774,749
Int. Cl. F21l *7/00*
U.S. Cl. 240—11.2 R 7 Claims



A lantern comprised of discrete side panels removably interconnected with each other and removably coupled to a base and roof are disclosed. Two of the side panels are each coupled to the roof and base. The remaining side panels are coupled only to the first-mentioned side panels.

3,603,785
HEADLAMP ADJUSTING SYSTEMS
Alfred Dickens Baker, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Feb. 4, 1969, Ser. No. 796,327
Claims priority, application Great Britain, Feb. 9, 1968, 6460/68
Int. Cl. B60q *1/10*
U.S. Cl. 240—61.1 8 Claims



In a headlamp adjusting system there is provided a member movable in opposite directions to adjust the position of a headlamp of a vehicle relative to the body of the vehicle so that its beam is tilted upwardly or downwardly respectively. A first piston and cylinder arrangement operatively interconnects the body and the wheel of the vehicle so that movement of the body relative to the wheel moves the piston relative to the cylinder. A second piston and cylinder arrangement is provided for controlling movement of the member associated with the headlamp relative to the body of the vehicle. A conduit interconnects the two piston and cylinder arrangements so that the flow of fluid through the conduit causes movement of the member to adjust the position of the headlamp. A valve is provided in the fluid line between the first and second piston and cylinder arrangements and the valve is operable to prevent flow of fluid between the piston

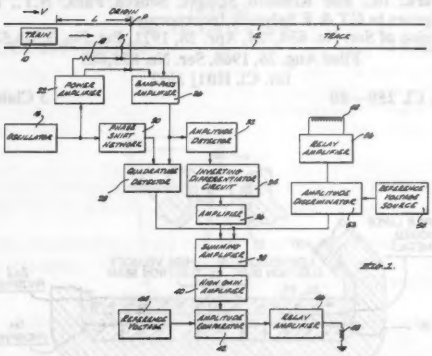
and cylinder arrangements so that the headlamp is not adjusted when the valve is operative. The valve is operated to prevent fluid flow while the vehicle is traveling so that the headlamp position is not adjusted as a result of suspension movements of the vehicle when the vehicle is traveling.

3,603,786

RAILROAD GRADE CROSSING PROTECTION SYSTEM

Richard V. Peel, La Verne, Calif., assignor to Marquardt Industrial Products Co., Cucamonga, Calif.

Filed Mar. 17, 1969, Ser. No. 807,626
Int. Cl. B61l *1/06, 29/32*
U.S. Cl. 246—128 **13 Claims**



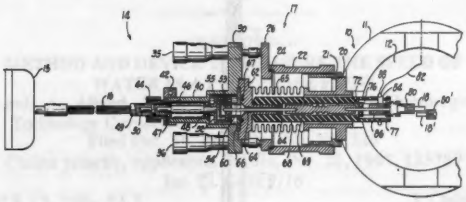
A railroad crossing warning indicator which predicts the time of arrival of trains to a grade crossing is described, which includes a quadrature detector which provides a distance voltage which is derived from the reactance magnitude, and an amplitude detector which provides a distance voltage derived from the impedance magnitude. The voltage derived from the impedance magnitude is applied to a differentiating circuit which provides the speed of the train. The reactance voltage from the quadrature detector and the impedance voltage derivative circuit from the differentiating circuit are then summed whereby the sum of the two voltages provides an improved estimate of the time of arrival of the train with the decrease in error.

3,603,787

SPARK-TYPE ION SOURCE AND DOWNSTREAM DEFLECTOR FOR MASS SPECTROMETER

Patrick Powers, Binstead, England, assignor to Associated Electrical Industries Limited, London, England

Filed May 16, 1967, Ser. No. 638,857
Claims priority, application Great Britain, May 17, 1966, May 17, 1966, 21825/66;21826/66
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9SA **28 Claims**



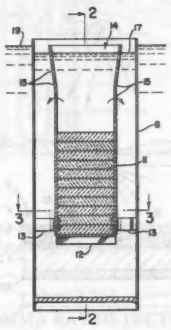
In a mass spectrometer, structure is provided to improve the statistical accuracy of an analytical spectrum especially in that situation where a sample is not homogeneous. The mechanism includes one or both of: (1) structure at the ion source for moving a sample relative to another sample or an electrode of another material; and (2) structure arranged near the ion beam to deflect or suppress the ion beam.

3,603,788

GAMMA RADIATION SOURCE AND METHOD FOR THE TREATMENT OF SEWAGE

Floro D. Miraldi, 2660 Edgehill Rd., Cleveland Heights, Ohio, and Edward J. Morgan, 19713 Shakerwood Rd., Warrensville Heights, Ohio

Filed May 6, 1968, Ser. No. 726,823
Int. Cl. G01n *21/26*
U.S. Cl. 250—44 **14 Claims**



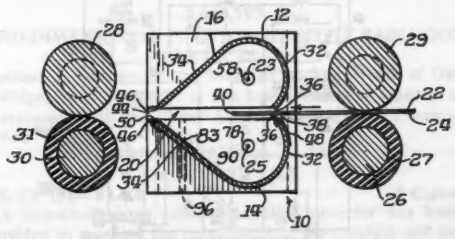
A method is disclosed for the treatment of contaminated water (sewage) by the gamma rays from fission byproduct waste so as to kill bacteria and/or degrade chemical waste in the contaminated water. The fission byproduct waste is encapsulated in a leach-resistant glass or ceramic product to form a radiation source. The radiation source is held by a holder inside a casing containing coolant. The source, holder, casing and coolant form a natural convection cell for the dissipation of heat. The casing with contents form radiation cells which may be interlocked into rows to form channels. The rows of cells may be fitted with guide vanes to give a generally helical motion and mixing of the contaminated water so as to ensure uniform irradiation of the water. The channels may be cleaned by high velocity water jets. As a result, a treatment plant may be designed and built so that sewage receives at least 0.14 megarads of radiation, which is sufficient to kill at least 99.99 percent of the Escherichia Coli bacteria degrade many chemical compounds, especially the benzyl sulfonate detergents, and accelerate sedimentation.

3,603,789

HEART-SHAPED CORONA DISCHARGE DEVICE

Leo J. Da Prato, Des Plaines, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 29, 1969, Ser. No. 828,890
Int. Cl. H01j *37/04*
U.S. Cl. 250—49.5 ZC **7 Claims**



Electrostatic charging apparatus for charging a photoconductive coating on a sheet member, having improved guiding means including exterior, converging housing walls for guiding the sheet member to an entrance throat of the charging

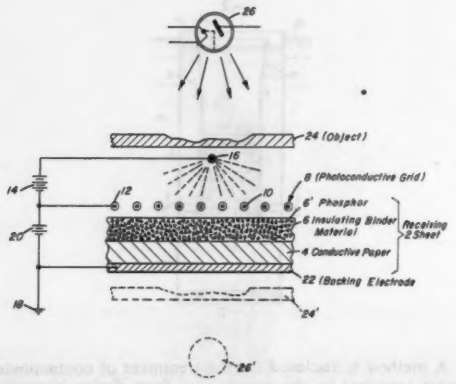
apparatus and interior converging housing walls for guiding the sheet member to an exit throat of the apparatus. The apparatus is void of any interior mechanical guiding structure, exhibits improved charging efficiency due to a novel housing design, and may also be fabricated economically.

3,603,790

ELECTRORADIOGRAPHIC PROCESS

Henry M. Cleare, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1968, Ser. No. 725,389
Int. Cl. G03g *13/00*
U.S. Cl. 250—65 13 Claims



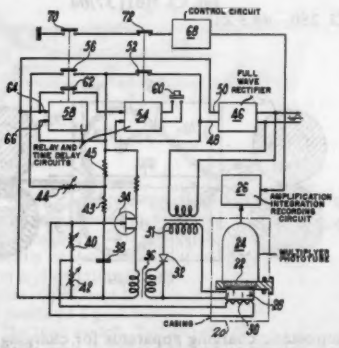
A process by which the radiographic radiation applied to an object for exposure thereof is used to form directly and indirectly a conductivity pattern on a conductive grid comprising a wire mesh completely covered with a photoconductive insulating material. A flow of ions directed toward the grid is modulated to produce a latent electrostatic image on the surface of an image receiving material, the latter and a radiographic fluorescent material are arranged in close proximity to said grid and in contact with a conductive backing member.

3,603,791

METHOD AND DEVICE FOR READING THERMOLUMINESCENT DOSIMETERS

Roger Chenault; Guy Portal; Emile Porrot, and Raymond Prigent, all of Fontenay-Aux-Roses, France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Apr. 7, 1969, Ser. No. 813,830
Claims priority, application France, Apr. 18, 1968, 148,588
Int. Cl. G01t *1/11*
U.S. Cl. 250—71.5 8 Claims



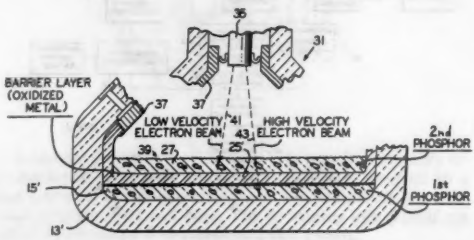
Thermoluminescent dosimeters (e.g., Lif, CaF_2) are heated from the variable initial temperature of a dosimeter reader to a predetermined temperature which is higher than the range of emission of peaks which are subject to "fading" for the emission of such peaks to be complete. Immediately after that step, the temperature of the dosimeter is progressively increased to a temperature which is sufficient to cause the emission of all significant peaks and the total light emission of the dosimeter during said temperature rise is then measured. A reader including a temperature regulation circuit is described which automatically carries out the above sequence.

3,603,792

LUMINESCENT SCREEN HAVING A SEPARATION MEDIUM THEREIN

Anthony V. Gallaro, Auburn, N.Y.; Walter F. Kazuk, Loves Park, Ill., and Kenneth Speigel, Seneca Falls, N.Y., assignors to GT & E Sylvania Incorporated

Division of Ser. No. 634,724, Apr. 28, 1971, Pat. No. 3,526,527.
Filed Aug. 26, 1968, Ser. No. 853,085
Int. Cl. H01j *1/62*
U.S. Cl. 250—80 3 Claims



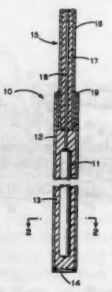
A plural color cathodoluminescent screen for use in a cathode-ray tube wherein at least two layers of light-emitting phosphors have therebetween a separation layer of electrically conductive oxide material that is substantially translucent to electromagnetic radiation and substantially opaque to the penetration of electron beams of predetermined velocity. The screen includes a nucleation to achieve the uniform disposition of an oxidizable metal which when substantially heated forms the metallic oxide of the separation layer.

3,603,793

RADIATION DETECTOR SOLID STATE RADIATION DETECTION USING AN INSULATOR BETWEEN THE EMITTER AND COLLECTOR

Holland D. Warren, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Aug. 1, 1969, Ser. No. 846,791
Int. Cl. G01t *3/00*
U.S. Cl. 250—83.1 6 Claims



An improved radiation detector which affords a prompt response to changes in the neutron and gamma flux incident upon a ytterbium emitter by using a thickness of insulator

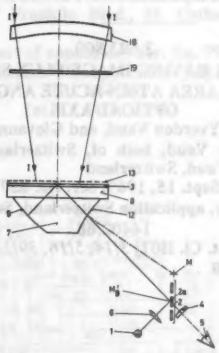
between the emitter and collector that is sufficient to absorb delayed electrons emitted at a lower energy level from the emitter and yet allow prompt electrons emitted at a higher energy level from the emitter to reach the collector. By thus eliminating the delayed electrons, the signal output current of the detector represents the instantaneous value of the incident neutron and/or gamma flux.

3,603,794

APPARATUS FOR TRANSDUCING INFRARED IMAGES INTO VISIBLE IMAGES UTILIZING A LIQUID LIGHT CONTROL LAYER

Fred Mast, Zuzwil/SG, Switzerland, assignor to Ciba Limited, Basel, Switzerland

Filed July 10, 1970, Ser. No. 53,952
Claims priority, application Switzerland, July 18, 1969, 11074/69
Int. Cl. G01t *13/00*
U.S. Cl. 250—83.3 HP **7 Claims**



Apparatus for making incoming infrared rays visible includes an infrared optical system which serves to focus the rays through an optical grating onto the surface of a deformable liquid film deposited on a plane face of a transparent prism, the prism being so disposed in the path of a Schlieren-optical system that a beam of visible light produced by a source enters the liquid film from the baCk, is totally internally reflected at its surface adjacent the grating onto a concave mirrored surface of the prism which returns the beam to the liquid where it is again totally internally reflected by the liquid surface and then imaged on the bar-and-slot system of the schlieren-optics. In the absence of incoming infrared rays, the surface of the liquid film remains undeformed and the beam of visible light is turned back into its source. Upon deformation of the liquid surface by incoming infrared rays, visible light returning from the prism passes through the slots of the bar-and-slot system to establish an observable image of the deformation.

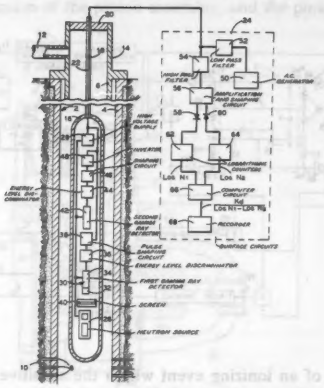
3,603,795

METHOD AND DEVICE TO MEASURE THE SPEED OF WATER IN A POLYPHASE FLOW

Louis A. Allaud, Paris, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 31, 1968, Ser. No. 772,325
Claims priority, application France, Dec. 26, 1967, 133789
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 **1 Claim**

An illustrative embodiment of the invention measures water speed through oxygen activation. Typically, neutrons of sufficient energy to initiate $O^{16}(n,p)N^{16}$ reactions irradiate a fluid stream, as for example, the usual polyphase stream of fluids flowing through the borehole of a producing oil well. Two gamma ray detectors spaced at different distances from each other downstream from the neutron source register the 6 mev. gamma radiation that characterizes N^{16} disintegration.



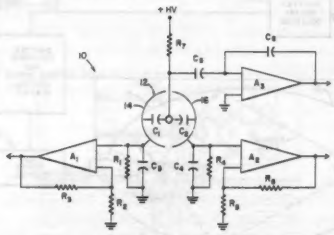
The water speed then is determined through the ratio of the counts registered by the two detectors.

3,603,796

SEGMENTED GAMMA RAY DETECTOR AMPLIFIER SPECTROMETER

Robert L. Chase, Blue Point, N.Y., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 23, 1969, Ser. No. 793,384
Int. Cl. G01t *1/24*
U.S. Cl. 250—83.3 R **1 Claim**



An amplifier for use with a segmented-gamma ray detector employing internal detector summing of the linear signal to eliminate the need for complicated external preamplifier gain adjustment and stability. Each segment of the detector is capacitively coupled to a voltage sensitive preamplifier and a charge preamplifier takes the whole charge of the detector.

3,603,797

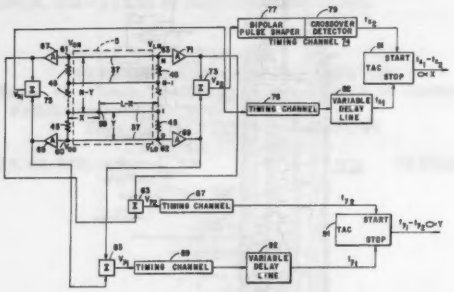
TWO-DIMENSIONAL POSITION-SENSITIVE RADIATION DETECTOR

Casimer J. Borkowski, and Manfred K. Kopp, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 10, 1970, Ser. No. 18,125
Int. Cl. G01t *1/18*
U.S. Cl. 250—83.6 R **8 Claims**

A two-dimensional position-sensitive detector has been provided to measure the coordinates of the location and the energy loss of charged particles and ionizing radiation. The device comprises an ordered array of high resistance collector wires strung in parallel. Adjacent wires are interconnected at both ends by a series of resistors so as to form a

four output terminal network. A comparison of the rise times of the output pulses from these four terminals gives the coordinates of an ionizing event within the sensitive area of the detector. The amplitude of the sum of the four output pulses gives the energy loss of the event in the detector gas.



3,603,798

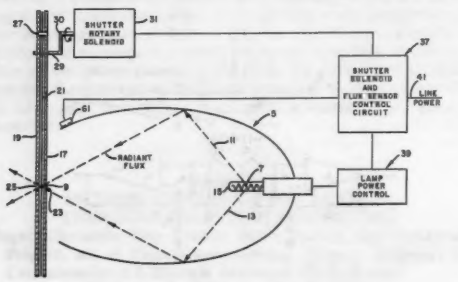
HIGH INTENSITY RADIANT ENERGY PULSE SOURCE HAVING MEANS FOR OPENING SHUTTER WHEN LIGHT FLUX HAS REACHED A DESIRED LEVEL

Larry D. Russell, San Jose, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed June 18, 1970, Ser. No. 47,443

Int. Cl. H01j *39/12*

U.S. Cl. 250—211 J **8 Claims**



A high intensity radiant energy pulse source is provided which requires no external cooling. A high intensity radiant energy source is located at one focal point of an ellipsoidal reflector and a shutter is positioned in the region of the other focal point. Monitoring means are provided for opening the shutter as soon as a predetermined flux level is reached. Additional means control the duration of time the shutter is open.

3,603,799

LIGHT MEASURING DEVICE COMPRISING A PLURALITY OF BINARY CIRCUITS FOR PROVIDING A DIGITAL REPRESENTATION OF PHOTOCELL OUTPUT

Tsukumo Nobusawa, Aska-shi, Japan, assignor to Asahi Kogaku Kogy Kabushiki Kaisha, Tokyo-to, Japan

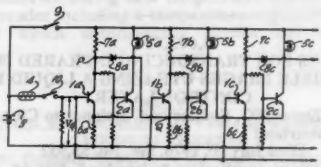
Filed Mar. 26, 1969, Ser. No. 810,767

Claims priority, application Japan, Apr. 1, 1968, Mar. 10, 1969, 43/21022; 44/17860

Int. Cl. H01j *39/12*; **G01j** *1/42*

U.S. Cl. 250—214 R **7 Claims**

A light measuring device includes successive transistor Schmitt triggers having emitter resistors of successively higher resistances, the collector of the input transistor of each trigger being connected through a diode to the emitters of the next successive trigger. A voltage divider includes a photoconductor and resistor series connected across a battery the voltage across the resistor being applied to the Schmitt triggers. The trigger outputs are connected to lamps



and may be connected to relay solenoids which control the insertion of resistances in a shutter timing RC network. The photoconductor may control the charging of a capacitor which is coupled through a high impedance input amplifier to the Schmitt trigger inputs.

3,603,800

TELEMETER HAVING IMAGE FLUX SEPARATOR WITH OPAQUE AREA AT AN ACUTE ANGLE WITH THE OPTICAL AXIS

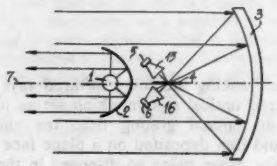
Jesus de Andres, Yverdon Vaud, and Giovanni Odone, La Rosiaz, Lausanne Vaud, both of, Switzerland, assignors to Paillard S.A., Vaud, Switzerland

Filed Sept. 15, 1969, Ser. No. 857,812

Claims priority, application Switzerland, Sept. 26, 1968, 14402/68

Int. Cl. H01j *3/14*, *5/16*, *39/12*

U.S. Cl. 250—220 **10 Claims**



The invention provides a high sensitivity in a telemeter of the type including a convergent optical receiving system reflecting the rays from the object the range of which is to be ascertained and two different photocells the exposure of which to said rays varies in opposite directions in accordance with the location of the point of convergence of said rays and to this end there is provided an element separating the rays impinging on the group of photocells and extending along a straight line passing through a predetermined point of convergence between two ranges of points of convergence for which the photocells are selectively predominant.

3,603,801

ELECTROOPTIC INFORMATION READ-OUT DEVICE USING POLARIZED LASER LIGHT

Thomas J. Harris, Poughkeepsie; Kurt M. Kosanke, Wappingers Falls; Werner W. Kulcke, Wappingers Falls, and Erhard Max, Wappingers Falls, all of, N.Y., assignors to International Business Machines Corporation, New York, N.Y.

Division of Ser. No. 356,442, Apr. 1, 1964, Pat. No. 3,469,206.

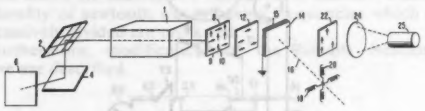
Filed Apr. 16, 1969, Ser. No. 839,750

Int. Cl. G02f *3/00*

U.S. Cl. 250—225 **8 Claims**

Information from a laser cavity having a magnetic storage member with different areas magnetized in different

directions within the cavity producing different light polarizations is obtained by a polarization selection device including an analyzer and an electrooptic device which is operative in response to a scanning electron beam. The polarization selec-



tion device may include a pair of analyzers with their polarization directions orthogonal to one another and the electrooptic device positioned between the pair or a light deflecting device.

3,603,802

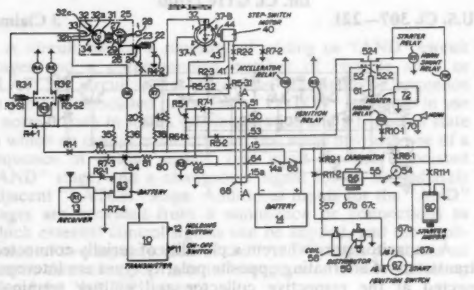
REMOTE CONTROL AUTOMOBILE MOTOR STARTER

Frank Petric, 37 Franklin Blvd., St. Catharines, Ontario, Canada

Continuation-in-part of application Ser. No. 799,048, Feb. 13, 1969, now abandoned. This application July 24, 1969, Ser. No. 844,561

Int. Cl. F02n *11/00*

U.S. Cl. 290—37 **22 Claims**



A method and device for starting an internal combustion engine by remote control, in which a single frequency receiver, and preferably a single frequency transmitter, are used. The motor is started by transmitting two signals within a maximum time interval, preferably a predetermined time interval, between them. A discharging capacitor governs the device using a maximum time interval while a timing mechanism together with switch means or a capacitor governs the device using a predetermined time interval.

3,603,803

ELECTRIC STARTER MOTORS

Roy Price Bowcott, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

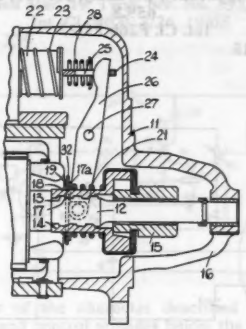
Filed Sept. 25, 1969, Ser. No. 860,871

Claims priority, application Great Britain, Oct. 4, 1968, 47191/68

Int. Cl. F02n *11/02*

U.S. Cl. 290—38 A **3 Claims**

An electric starter motor for an internal combustion engine includes a casing, and a rotor shaft journaled for rotation in the casing. A pinion assembly is mounted on the rotor shaft for rotation with the rotor shaft, and is also capable of axial movement relative to the rotor shaft. A lever is coupled at one end to the pinion assembly, and is pivotally mounted intermediate its ends on the casing. Solenoid means is coupled to the end of the lever remote from the pinion assembly, so that operation of the solenoid means causes pivotal movement of the lever and therefore moves the pinion assembly axially relative to the rotor shaft. The lever is coupled to the pinion assembly through a plate which is pivotally connected to said one end of the lever. The plate is pivotable relative to the lever about an axis extending generally at right angles to the axis of rotation of the pinion assembly, and the pinion assembly is engaged with said plate so as to be rotatable relative thereto. Said plate is capable of movement relative to the pinion assembly in a plane generally at right angles to the axis of rotation of the pinion assembly.



3,603,804

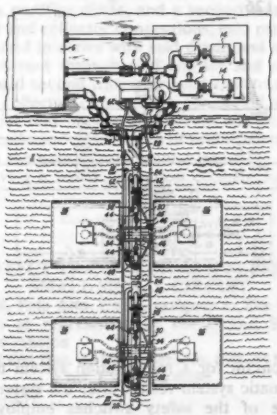
WAVE OPERATED POWER APPARATUS

Jesse Marion Casey, Scottsboro, Ala., assignor to Dr. A. Carl Collins and Dawson, McGinty and Livingston, Scottsboro, Ala., part interest to each

Filed Feb. 16, 1970, Ser. No. 11,522

Int. Cl. F03b *13/12*

U.S. Cl. 290—42 **7 Claims**



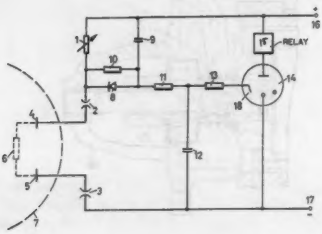
An elongated U-shaped pipeline has floats pivoted on transverse axes for rocking thereon in response to wave action in water which the floats are buoyant. Rocking of the floats operates pumps arranged in pressure compounding relation and the fluid under pressure is delivered to a shore-based storage tank. The storage tank being sealed allows build up of a pressure head. The fluid is let out through a regulator to operate machinery. Spent fluid from the plant is spilled out into a recovery tank, directly under the motor or turbine. It is then picked up by the lower leg of the pipeline and returned to repeat its cycle again. The floats support the pipeline and can be flooded to sink below the surface to avoid damage by storm waves.

3,603,805

DEVICE FOR CONTROLLING LAUNDRY DRIERS WITH MECHANICAL MOVEMENT OF THE WASHING, IN DEPENDENCE UPON THE DEGREE OF DRYING

Konstantin Apel, Meersburg, (Bodensee), Germany, assignor to Holzer-Patent AG, Zug, Switzerland

Filed July 11, 1969, Ser. No. 840,925
Claims priority, application Germany, July 11, 1968, P 17 63 659.8
Int. Cl. F26b *25/22*
U.S. Cl. 307—118 **8 Claims**



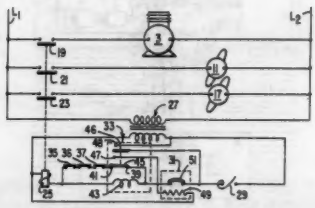
In a resistance measurement type drier control, the control circuit of the drier includes a capacitor connected to the resistance bridge electrodes and an integrator coupled to the capacitor, the time constants of the capacitor and integrator being related to the drum rotation time.

3,603,806

REFRIGERATION SYSTEM CONTROL

Milton H. Hitzke, Indianapolis, Ind., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 1, 1969, Ser. No. 846,663
Int. Cl. H01h *43/00*
U.S. Cl. 307—126 **8 Claims**



A control circuit for a refrigeration system to provide a delayed automatic system restart after the system is deenergized by one of the safety switches employed therein. Delayed energization of the system when the thermostat contacts close is also provided to prevent rapid cycling, to allow system pressure equalization, and to prevent compressor damage.

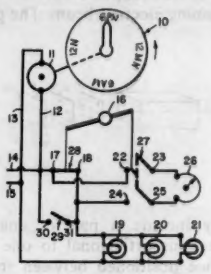
3,603,807

TIMECLOCK DIMMING CONTROL

Clifford D. Erdmann, 15338 Leonard St., Spring Lake, Mich.

Filed July 11, 1969, Ser. No. 840,907
Int. Cl. H01h *7/00*
U.S. Cl. 307—141 **2 Claims**

A control system for electrical circuits having "off" periods, "full on" periods, and periods of limited current flow. A timer-controlled switch mechanism incorporates a dimmer unit into a load circuit exclusively during periods of



limited current flow, keeping the dimmer isolated completely during other phases of the control cycle.

3,603,808

CAPACITOR STORE

Frederik Leonard Johan Sangster, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 21, 1969, Ser. No. 826,537
Claims priority, application Netherlands, May 25, 1968, 6807435
Int. Cl. G11c *11/00*
U.S. Cl. 307—221 **3 Claims**

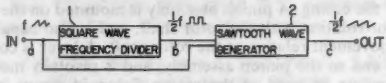
A capacitor store wherein a plurality of serially connected transistors of alternating opposite polarity types are interconnected at the respective collector and emitter terminals thereof, at each of which connection points a capacitor is connected between the connection point and ground. Alternate transistors are connected to sources of oppositely polarized switching pulses. In the interval between switching pulses of like polarity a second pair of switching pulses of the same polarity as the corresponding first switching pulses are applied through diodes to the collectors of each transistor in the capacitor store.

3,603,809

FREQUENCY-DIVIDED SAWTOOTH WAVE GENERATING CIRCUIT

Yasuji Uchiyama, Hamakita-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Jan. 2, 1970, Ser. No. 365
Claims priority, application Japan, Jan. 11, 1969, , Jan. 31, 1969, Jan. 31, 1969, Jan. 31, 1969, Jan. 31, 1969, Feb. 3, 1969, 44/2220; 44/2221; 44/6642; 44/6643; 44/6644; 44/6645 44/9291
Int. Cl. H03k *4/08*
U.S. Cl. 307—228 **10 Claims**



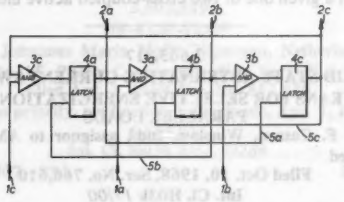
A circuit consisting of a square wave frequency divider which converts its input sawtooth wave having a frequency *f*

into an output square wave having a frequency *f*/2 and a mixer for mixing said output wave and said input sawtooth wave by equal peak amplitudes, said circuit being a principal circuit of the invention and being used to produce a sawtooth wave having a frequency *f*/2.

A plurality of stages each consisting of the circuit mentioned above are successively connected in cascade, whereby a plurality of sawtooth waves having frequencies which are successively divided are produced.

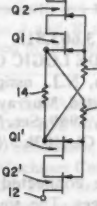
Furthermore, modifications of the circuits mentioned above are described.

3,603,810
SEQUENCE CONTROL CIRCUITS
Kenneth Hubert Clayson, Solihull, England, assignor to Wilmot-Breeden Limited
Filed Sept. 3, 1968, Ser. No. 756,939
Int. Cl. H03k *5/20*
U.S. Cl. 307—232 **1 Claim**



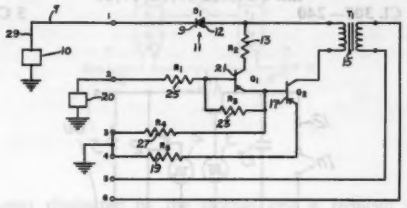
A circuit having a plurality of adding or "AND" circuit stages and a corresponding number of bistable state or "LATCH" circuit stages connected alternately in sequence to provide associated pairs. Each "LATCH" stage has in use a normal state in which it is inoperative and a triggered state in which an output connection of that stage provides one of a sequence of output signals, one input for the associated "AND" stage, and a changeover signal for an immediately adjacent "LATCH" stage. Additional inputs for the "AND" stages are provided from a connection or connections to which external control signals can be applied, and the application of two inputs to one of the "AND" stages produces an output thereof which acts to change over a corresponding one of the "LATCH" stages.

3,603,811
TWO-TERMINAL BIPOLAR SELF-POWERED LOW CURRENT LIMITER
Christopher C. Day, and Bo Holte, both of Newtonville, Mass., assignors to American Optical Corporation, Southbridge, Mass.
Filed Dec. 9, 1969, Ser. No. 883,412
Int. Cl. H03k *5/08*
U.S. Cl. 307—237 **8 Claims**



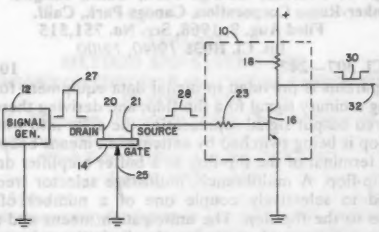
A two-terminal, bipolar, self-powered low current limiter having particularly advantageous use for limiting currents in body electrodes connected to biomedical electronic equipment to the microampere range. In one embodiment of the invention, a pair of series connected field effect transistors form a bipolar current limiting device. In another embodiment of the invention, four field-effect transistors are provided in the form of two series connected bistable devices. In both cases, an additional pair of field-effect transistors can be used to increase the breakdown voltage in both directions.

3,603,812
ELECTROLUMINESCENT PANEL DRIVER
Wolfgang Merel, Cedar Grove, N.J.
Filed Mar. 19, 1964, Ser. No. 353,307
Int. Cl. H03k *3/26, 19/08*
U.S. Cl. 307—239 **1 Claim**



1. A driver of the character described operable from power supply and control voltages below the firing potential of gas filled tubes, said driver comprising: a source of alternating electric current; a voltage step-up transformer having primary and secondary windings; solid state means connected in series with the primary winding of said transformer and with said source of alternating current for half-wave rectifying and for controllably interrupting half-wave current flow through said primary winding; a source of direct current control signals; a first transistor connected to said source of control signals and having conductive and nonconductive conditions in response to changes in said control signals, said first transistor being connected to said solid-state means and operative in one of said conditions to cause said solid-state means to interrupt said half-wave current flow through said primary winding, and in the other of said conditions to cause said solid-state means to permit said half-wave current flow whereby said secondary winding provides an alternating current output of higher voltage than said alternating current source and only in response to a predetermined voltage signal form said control signal source; said solid-state means comprising a rectifier diode, and a second transistor having base, emitter and collector connections, said primary winding being connected in series with said diode and said source of alternating current through said emitter and collector connections of said second transistor; said first transistor having emitter and collector connections connected in series with said diode and said alternating current source, one of said emitter and collector connections of said first transistor being connected to the base of said second transistor, and said first transistor having a base connection coupled to said control signal source.

3,603,813
FIELD EFFECT TRANSISTOR AS A BUFFER FOR A SMALL SIGNAL CIRCUIT
James N. Hall, Palo Alto, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission
Filed Dec. 3, 1969, Ser. No. 881,811
Int. Cl. H03k *5/08*
U.S. Cl. 307—237 **2 Claims**



A field effect transistor having its drain and gate electrodes connected across a large signal generator and its source and

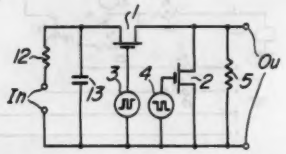
gate electrodes connected across the input of a small signal circuit for protecting the circuit from high level signal variations at the generator.

3,603,814

SERIES-SHUNT TYPE SEMICONDUCTOR CHOPPER

Shin-ichi Ohashi, Kodaira-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 27, 1969, Ser. No. 811,105
Claims priority, application Japan, Apr. 10, 1968, 43/23362
Int. Cl. H03k *17/16, 17/60*
U.S. Cl. 307—240 **5 Claims**



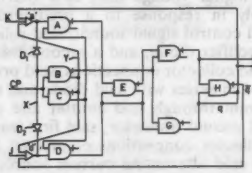
A series-shunt type semiconductor chopper comprising two switching elements which are excited so as to be rendered conductive for a predetermined period of time when they have their conductivities changed, respectively.

3,603,815

BISTABLE CIRCUITS

Ramachandra Aragula Rao, Wallington, Surrey, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 30, 1968, Ser. No. 725,460
Claims priority, application Great Britain, May 2, 1967, 20,191/67
Int. Cl. H03k *3/12*
U.S. Cl. 307—247 **3 Claims**



An additional AND-gate connected to the clock pulse input of a J–K flip-flop provides an inhibiting input to each of the J and K input AND-gates in response to a clock pulse received before a flip-flop switching input is applied to the J–K input gates. The inhibiting input prevents the flip-flop from reversing state in response to a switching input applied during a clock pulse, and permits a change of state only if the switching input is received by the flip-flop before the application of the clock pulse.

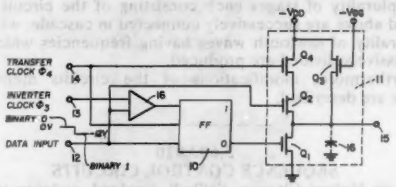
3,603,816

HIGH SPEED DIGITAL CIRCUITS

George V. Podraza, Canoga Park, Calif., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.

Filed Aug. 9, 1968, Ser. No. 751,515
Int. Cl. H03k *19/40, 19/00*
U.S. Cl. 307—247 **10 Claims**

Apparatus is provided in digital data equipment for transferring a binary signal to a flip-flop, and deriving therefrom a buffered output signal representing the state into which said flip-flop is being switched by anticipation means coupling the input terminal of the flip-flop to a buffer amplifier driven by the flip-flop. A multibranch, multistage selector tree is employed to selectively couple one of a number of binary signals to the flip-flop. The anticipation means and selector tree overcome and minimize the limitations in switching speeds inherent in such apparatus implemented with insulated-gate, field-effect transistors in an integrated circuit. Switching speed of the flip-flop is increased by the combination of (1) a push-pull arrangement such that when a binary



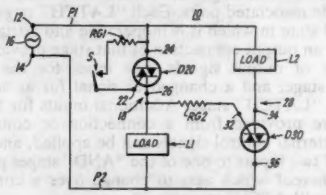
signal is applied to one side the complement of the binary signal is applied to the other side, and (2) an anticipation circuit temporarily shunting current around a load resistor in series with a given one of two cross-coupled active elements.

3,603,817

SOLID STATE ALTERNATING CURRENT SWITCH MEANS FOR SELECTIVE ENERGIZATION OF PARALLEL LOADS

Charles F. Casson, Winslow, Ind., assignor to AMF Incorporated

Filed Oct. 10, 1968, Ser. No. 766,510
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 B **12 Claims**



An AC load circuit having first and second loads connected in parallel is provided with switching means for selectively energizing such loads including first and second bilateral semiconductor triodes of the thyristor type connected by their power electrodes in series between their respective loads and opposite sides of an AC source, a control switch and first coupling resistance connecting the gate electrode of the first triode and a second coupling resistance connecting the gate electrode of the second triode to the source and load connected electrodes, respectively, of the first triode.

3,603,818

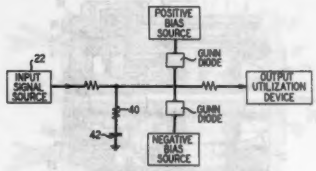
GUNN-DIODE LOGIC CIRCUITS

Gerard White, Marlboro, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

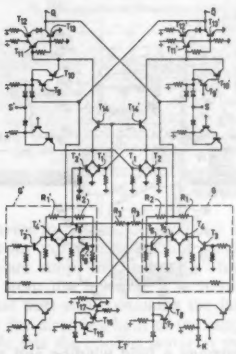
Filed June 17, 1969, Ser. No. 833,973
Int. Cl. H03k *5/00*
U.S. Cl. 307—260 **9 Claims**

Two Gunn diodes are connected in series between oppositely poled bias sources. The sources are selected such that in the absence of high-field domains in the diodes the internal field in each diode is just above the threshold for domain propagation. When a high-field domain propagates in one diode, the internal field available in the other device is below the minimum value required to achieve domain nucleation. By applying a bias current to an input-output node point between the diodes, it is possible thereby to selec-

tively give preference to domain nucleation in either diode. This basic two-diode arrangement is utilized to form a threshold detector, a bistable circuit, a pulse regenerator and an analog-to-digital converter.



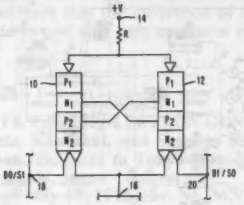
3,603,819
JK-FLIP-FLOP
Nicolaas Johannes Maria Molle, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 2, 1969, Ser. No. 812,616
Claims priority, application Netherlands, Apr. 9, 1968, 6,805,036
Int. Cl. H03k *3/12, 3/286*
U.S. Cl. 307—291 **5 Claims**



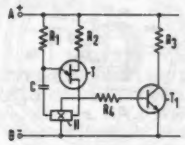
A JK-flip-flop of the master-slave type wherein the output signals from the slave flip-flop are each fed back to a separate input gate each consisting of separate partial gates. The J and K signals are both fed to each of the input gates whereby changes in the J and K signals occurring during a clock pulse are registered in the slave flip-flop.

3,603,820
BISTABLE DEVICE STORAGE CELL
Claus H. Schuenemann, Schonaich, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 26, 1968, Ser. No. 779,045
Claims priority, application Germany, Dec. 15, 1967, P 15 24 892.7
Int. Cl. H01l *19/00*
U.S. Cl. 307—305 **3 Claims**

This specification describes a semiconductor storage cell that employs two cross-coupled PNPN switching devices as its active elements. At any given time one switching device conducts while the other switching device is held off by the crosscoupling between the two devices. By using the mentioned switching devices in place of transistors, the amount of power dissipated by the storage cell is reduced considerably.



3,603,821
CIRCUIT ARRANGEMENTS FOR PULSING THE CONTROL CURRENT OF A HALL GENERATOR
Dieter Flachsbarth, Ruckersdorf, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munchen, Germany
Filed May 19, 1969, Ser. No. 825,585
Claims priority, application Germany, May 21, 1968, P 17 65 454.5
Int. Cl. H01r *5/00*
U.S. Cl. 307—309 **6 Claims**

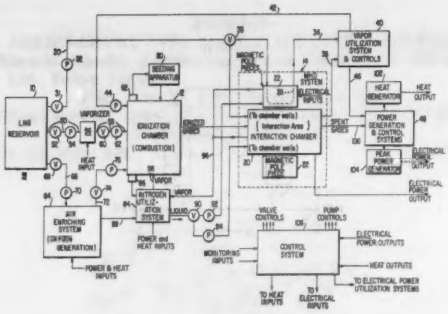


A pulse generator circuit includes a unijunction transistor having an emitter electrode connected to a common point in the connection between the resistor and capacitor of an RC circuit, a base 1 electrode, a base 2 electrode and an interbase path. A Hall generator is connected in series with the unijunction transistor via the interbase path of the transistor and has one control current electrode connected to the base 1 electrode of the unijunction transistor, another control current electrode connected to the capacitor of the RC circuit, one Hall voltage electrode connected to the negative polarity terminal of a source of DC voltage and another Hall voltage electrode galvanically connected to the control circuit of an electronic switching component.

3,603,822
METHOD AND SYSTEM FOR MAGNETOHYDRODYNAMIC GENERATION OF ELECTRICITY
Robert E. Petsinger, Upper St. Clair, Pa., assignor to LNG Services, Inc., Pittsburgh, Pa.
Filed Feb. 7, 1969, Ser. No. 797,460
Int. Cl. H02m *4/02*
U.S. Cl. 310—11 **6 Claims**

In the magnetohydrodynamic generation of electricity, a method and system are provided employing liquified natural gas as a source of refrigeration, as a source of gaseous medi-

um to be ionized, as a power source for the generation of oxygen employed in the combustion process for ionization of



gases, and as a fuel for various power and heat generation functions.

3,603,823

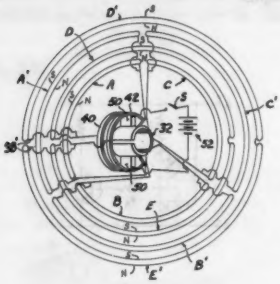
MAGNETIC MOTOR WITH PLURALITY OF STATORS

Elmer B. Mason, 901 Vickie Dr., Oklahoma City, Okla.

Filed Dec. 9, 1969, Ser. No. 883,526

Int. Cl. H02k *23/36*

U.S. Cl. 310—46 **2 Claims**



An electric motor frame is defined by spaced-apart generally circular end members which coaxially journal a rotor comprising a drive shaft having a disklike flange secured thereto medially the spacing of the end members. Stator coils are concentrically secured to the inner surface of at least one end plate and field coils are secured to at least one side surface of the rotor in concentric outwardly spaced relation with respect to the stator coils. Brush rigging, connected with the rotor, supports a pair of brushes interposed between a commutator and slip rings concentrically surrounding the drive shaft and supported by one frame end member to complete a current switching action to the stator coils.

3,603,824

WIRING HARNESS FOR ELECTRICAL ROTARY MACHINES

Joachim Csaki, Stuttgart, Germany, assignor to Ackermann u. Schmitt K.G., Stuttgart, Germany

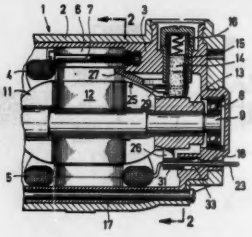
Filed Mar. 11, 1970, Ser. No. 18,660

Claims priority, application Germany, Mar. 12, 1969, P 19 12 535.0

Int. Cl. H02k *13/00*

U.S. Cl. 310—71 **9 Claims**

A wiring harness for assembling electrical rotary machines having field coils and a rotary armature comprises a plastic spider for positioning a resilient metal clip which connects a



field coil with a fixed brush and guides a wire connected with a field coil into alignment with an opening in the housing for the wire.

3,603,825

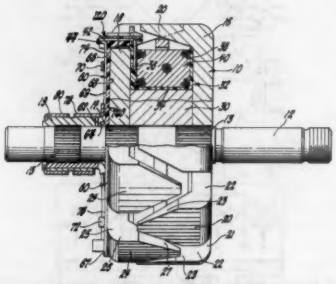
WINDING SPOOL AND LEAD SUPPORT INSULATOR FOR ROTORS OF ALTERNATING CURRENT GENERATORS

John J. Sheridan, Middletown; Gene D. Bricker, Wilkinson, and Donald F. Wigner, Anderson, all of, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 21, 1970, Ser. No. 39,237

Int. Cl. H02k *3/00*

U.S. Cl. 310—194 **3 Claims**



A spool for carrying a field winding and an insulator for carrying leads connected to the ends of the winding are located on opposite sides of an intervening rotor segment. Barrellike projections on the insulator extend through openings defined by the spaces between the pole tips of the rotor segment and engage apertures in ears extending radially from a circular flange on the spool. The leading end of the field winding is guided out to a terminal on the insulator from a central region on the spool through an undercut protective groove on the inside of the flange and then through the aperture and bore in a mating set of ears and projections. The terminating end of the field winding is guided out to another terminal on the insulator through apertures in another mating set of ears and projections. The ends of the field windings are terminated with leads held by the insulator and connected with slip rings.

3,603,826

ROTOR-STATOR ASSEMBLY HAVING REDUCED INERTIA

Simon Saretzky, Sands Point, N.Y., assignor to IMC Magnetics Corporation

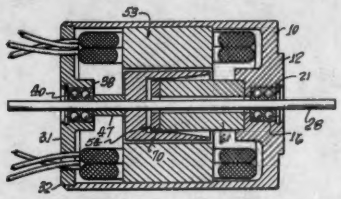
Filed Oct. 31, 1969, Ser. No. 872,923

Int. Cl. H02k *1/22*

U.S. Cl. 310—266 **8 Claims**

A stator rotor and permanent magnet assembly constituting a stepper motor or induction-type generator having

reduced inertia. A nonrotating permanent magnet is provided. A rotor is configured to have a part rotating in a gap between the stator poles and the permanent magnet. The



permanent magnet is mounted at one end from the housing so that the magnetic field is through the stator poles axially of the permanent magnet and through a part of the housing.

3,603,827

COOLING DEVICE FOR MERCURY-ARC LAMP OR THE LIKE

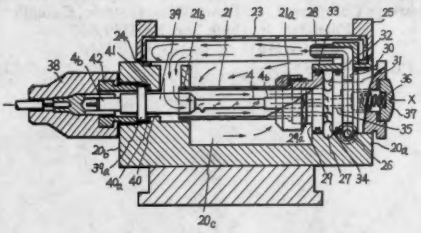
Jiro Degawa, Chiba-ken, and Osamu Takeuchi, Tokyo, both of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 26, 1969, Ser. No. 836,868

Claims priority, application Japan, June 29, 1968, 43/45377

Int. Cl. H01j *7/26*

U.S. Cl. 313—24 **8 Claims**



A cooling device for a mercury-arc lamp having a housing, an inlet nozzle for introducing cooling water into the housing, a mercury-arc lamp, an exhaust port for discharging the cooling water from the housing, a conduit communicating with the exhaust port and containing the lamp, and a transparent window for directing light of the lamp to the outside. The inlet nozzle jets the cooling water in the vicinity of the window.

3,603,828

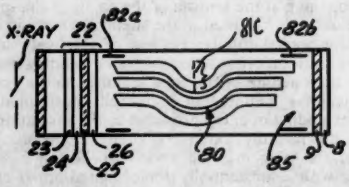
X-RAY IMAGE INTENSIFIER TUBE WITH SECONDARY EMISSION MULTIPLIER TUNNELS CONSTRUCTED TO CONFINE THE X-RAYS TO INDIVIDUAL TUNNELS

Edward Emanuel Sheldon, 30 East 40th Street, New York, N.Y.

Filed Jan. 28, 1969, Ser. No. 794,507

Int. Cl. H01j *29/68, 13/23, 31/26, 31/50*

U.S. Cl. 313—65 **10 Claims**



This invention relates to image intensifiers of multiplier type and which are especially useful for X-rays images. The novel device is characterized by construction in which each of the discrete X-rays beams corresponding to individual image points strikes the multiplying channel and is prevented from impinging in addition on adjacent multiplying channels. It is found that in order to accomplish this objective the lateral deviation of said multiplying channels between their entrance apertures and their exit apertures cannot exceed 1 mm.; and in addition that the difference of the level of said entrance apertures and said exit apertures cannot exceed 1 mm.

3,603,829

INLINE TYPE TRIPLE ELECTRON GUN ASSEMBLY

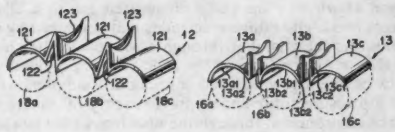
Asahide Tsuneta, Kawasaki, and Shinichi Sawagota, Tokyo, both of, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 13, 1970, Ser. No. 36,985

Claims priority, application Japan, May 16, 1969, 44/44,703

Int. Cl. H01j *29/50, 29/02, 19/42*

U.S. Cl. 313—70 C **4 Claims**



An in-line type triple electron gun assembly comprising three electron gun members which are juxtaposed in the common plane and each of which includes a plurality of electrodes spaced apart along its axis, respective corresponding electrodes of three electron gun members being connected by metal supporting strip members which are fused to insulating supporting rods between respective gun members so as to form an integral assembly.

3,603,830

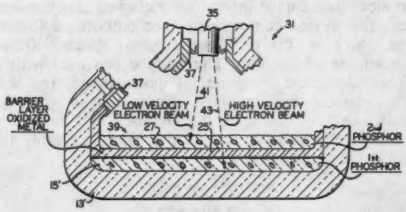
PENETRATION-TYPE COLOR TUBE WITH PHOSPHORS SEPARATED BY CONDUCTIVE BARRIER LAYER

Anthony V. Gallaro, Auburn, N.Y.; Walter F. Kazuk, Loves Park, Ill., and Kenneth Speigel, Seneca Falls, N.Y., assignors to Sylvania Electric Products Inc.

Division of Ser. No. 634,724, Pat. No. 3,526,527. Filed Aug. 26, 1969, Ser. No. 853,083

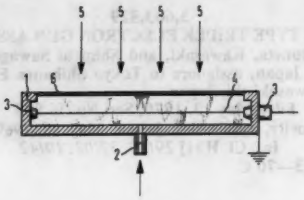
Int. Cl. H01j *29/28, 31/20, 29/20*

U.S. Cl. 313—92 PF **2 Claims**



A plural-color cathodoluminescent screen for use in a cathode-ray tube wherein at least two layers of light-emitting phosphors have therebetween a separation layer of electrically conductive oxide material that is substantially translucent to electromagnetic radiation and substantially opaque to the penetration of electron beams of predetermined velocity. The screen includes a nucleation to achieve the uniform disposition of an oxidizable metal which when subsequently heated forms the metallic oxide of the separation layer.

3,603,831
RADIATION DETECTOR WITH GAS-PERMEABLE RADIATION WINDOW
Hermann Kimmel, Parzivalstrasse 10, 8000 Munich, 23, Germany
Filed Sept. 4, 1968, Ser. No. 757,384
Claims priority, application Germany, Sept. 13, 1967, P 16 14 002.0
Int. Cl. H01j *39/26*
U.S. Cl. 313—93 2 Claims



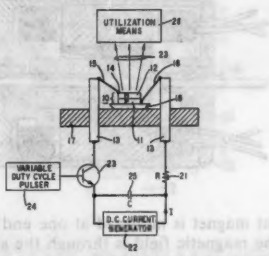
A detector for ionizing radiation of relatively low energy of the type in which a normally nonionized gas in a chamber connects two high-voltage electrodes and is ionized by radiation entering the chamber through a window in the chamber wall relatively permeable to the radiation, is provided with a window of fine wire gauze and continuously supplied with gas under a pressure sufficient to prevent entry of contaminants from the environment through the openings in the gauze. The screen window is more permeable to low-energy radiation than known windows.

3,603,832
IMAGE INTENSIFIER WITH CHANNEL-TYPE SECONDARY EMISSION MULTIPLIER
Brian William Manley, Burgess Hill; Pieter Schagen, Redhill, and John Adams, East Grinstead, all of, England, assignors to U.S. Phillips Corporation, New York, N.Y.
Filed Nov. 22, 1968, Ser. No. 785,846
Claims priority, application Great Britain, Nov. 28, 1967, 54133/67
Int. Cl. H01j *31/50, 39/02, 39/14*
U.S. Cl. 313—95 5 Claims

An electronic image intensifier including an electron multiplier. The device comprises a photocathode, a fluorescent screen, and a body between and spaced from the photocathode and screen. The body is provided with a plurality of elongated, longitudinal passageways, the walls of which are secondary emissive. Electrodes are provided on opposite surfaces bounding the channels and an electrically conductive electron-permeable membrane covering the entrance to each passageway.

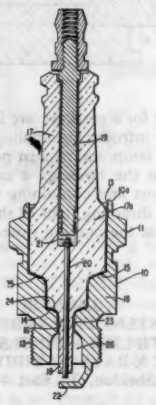
3,603,833
ELECTROLUMINESCENT JUNCTION SEMICONDUCTOR WITH CONTROLLABLE COMBINATION COLORS
Ralph Andre Logan, Morristown; Walter Rosenzweig, West Orange, and William Wiegmann, Middlesex, all of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Feb. 16, 1970, Ser. No. 11,413
Int. Cl. H05b *33/16*
U.S. Cl. 313—108 D 9 Claims

An electroluminescent PN junction gallium phosphide diode is fabricated with the P-type zone rich in zinc oxygen pairs and the N-type zone rich in isoelectronic nitrogen. In this diode, the apparent color of the emitted light can be controlled by varying the electrical current in the diode, from



the red through the yellow to the green portions of the color spectrum. Thereby, an electroluminescent diode device is afforded, having a threefold (or more) positive standby signal characteristic.

3,603,834
SPARK PLUG WITH SINGLE-PIECE CERAMIC INSULATOR WITH TUBULAR PORTION EXTENDING INTO SCAVENGING CHAMBER
Emil J. Novak, Garden City, N.Y., assignor to Hamilton-Hastings Company Ltd., Downsview, Ontario, Canada
Filed Jan. 8, 1969, Ser. No. 789,805
Int. Cl. H01t *13/16, 13/32, 13/36*
U.S. Cl. 313—11.5 5 Claims



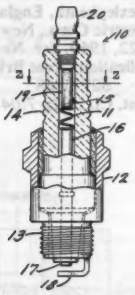
A spark plug assembly in which a metallic shell member has an upwardly opening cavity and a downwardly extending hole or opening at the bottom of the cavity, a one-piece insulating member is mounted in the shell member and has an integral, thin-walled tubular portion of relatively small, substantially constant cross-sectional area extending downwardly through the opening of the shell member, and a center electrode means is mounted in a centrally positioned, longitudinally extending opening provided in the insulating member and its downwardly extending tubular portion. The heat range of the plug may be varied by boring a scavenging chamber with a substantially dome-shaped upper end and of large cross-sectional area relative to the insulator tip size and of shallow depth relative to other spark plugs in the bottom of the shell member, the depth of the chamber determining the desired heat range.

3,603,835

SPARK PLUG WITH AN INTERNAL RESISTOR

Carl J. Eaton, Toledo, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Jan. 14, 1970, Ser. No. 2,752
Int. Cl. H01t 13/00
U.S. Cl. 313—118 7 Claims



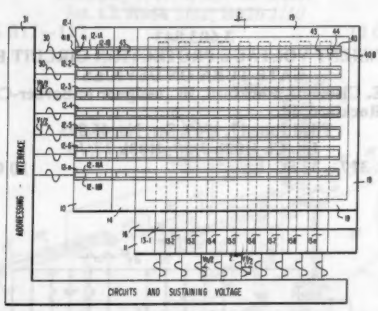
An improved low inductance spring for holding a noise suppression resistor either in the bore of a spark plug insulator or at some other suitable point in the ignition system for an internal combustion engine. The spring is formed from an elongated resilient conductor which is preferably flat. The conductor is shaped to have a plurality of reverse bends which simulate pleats in the bellows of an accordion.

3,603,836

CONDUCTOR CONFIGURATIONS FOR DISCHARGE PANELS

John D. Grier, 1720 Chief Okemos Circle, Okemos, Mich.

Filed Apr. 2, 1969, Ser. No. 812,801
Int. Cl. H01j 1/53, 11/02
U.S. Cl. 313—201 11 Claims



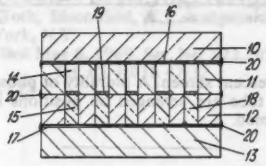
Gas discharge panel conductor configuration and conductor system to increase efficiency of light output conductor configuration which is substantially more likely to be electrically continuous. The conductors of a conductor array on a plate forming the viewing side of the panel are formed by sets of coplanar conductor elements spaced apart so that when a discharge occurs, an observer sees more of the center of the discharge which would ordinarily be partially hidden by a solid conductive line on the viewing side of the panel. The conductor elements of a set may be connected at regular intervals to provide a plurality of electrically parallel routes for conduction in case a section of a conductor element of a set is discontinuous. The gas discharge is more visible since the applied field between selected conductor elements is across two conductors which are not congruent as seen by the observer. Moreover, since the conductor elements are relatively narrow fringe light produced at a discharge site is better seen as to further enhance the delivery of light from the panel. Consult the specification for other features and details.

3,603,837

VISUAL DISPLAY DEVICES

George Christie Turner, 24 Greencroft Romily, Stockport, Cheshire, England

Filed Oct. 27, 1969, Ser. No. 869,799
Claims priority, application Great Britain, Nov. 9, 1968, 53200/68
Int. Cl. H01j 61/30
U.S. Cl. 313—220 10 Claims



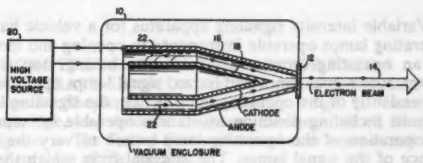
A display device comprises a plurality of gas-filled discharge devices arranged in a two-coordinate array. The discharge devices are formed in a plurality of cavities in a block, one end of each cavity being filled with an electrically resistive material and the remainder being filled with gas. Two sets of conductors are formed on the opposite surfaces of the block to enable any selected discharge device to be activated by the energization of the appropriate pair of coordinate conductors.

3,603,838

HIGH INTENSITY ELECTRON BEAM GENERATOR

David C. DePackh, Oxon Hill, Md.

Filed June 20, 1969, Ser. No. 835,025
Int. Cl. H01j 21/00, 29/46
U.S. Cl. 313—325 2 Claims



A high current electron beam generator including an anode and a cathode located within a vacuum enclosure. Both the anode and the cathode have a generally conical shape with the cathode being located inside the anode. Alternately, a coaxial alignment may be employed. Upon the application of a high voltage signal across the anode and cathode and due to the particular configurations used, electrons emitted from the cathode are forced to flow for the most part along rather than across equipotential lines of the electric field. This parapotential flow produces a high intensity electron beam which can be subsequently focused for use in various applications.

3,603,839

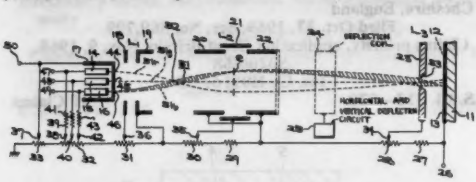
COLOR TELEVISION PICTURE TUBE OF THE SINGLE ELECTRON GUN TYPE

Kenjiro Takayanagi, Kamamira, Japan, assignor to Victor Company of Japan, Limited, Kanagawa-ku, Yokohama, Japan

Filed June 2, 1969, Ser. No. 829,260
Claims priority, application Japan, June 4, 1968, 43/38,152
Int. Cl. H01j 29/50
U.S. Cl. 315—13 4 Claims

A color television picture tube comprises a single electron gun including a plurality of cathodes arranged in a parallel relationship. A control grid is disposed near the cathodes and formed with a plurality of vertically oriented elongated slits. Each slit is disposed in a position corresponding to the posi-

tions of said cathodes. The electron beams, emitted from the electron gun, cross over and focus on a shadow mask. A postdeflection focusing of the electron beams forms an image



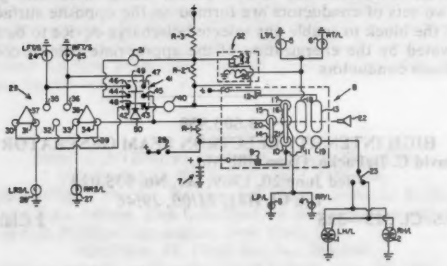
on a phosphorescent screen. A plurality of phosphor dots on the television tube are arranged on positions in which the images are formed.

3,603,840

VARIABLE INTENSITY VEHICLE-SIGNALING SYSTEM

Gideon A. DuRocher, Mount Clemens, Mich., assignor to Essex Wire Corporation, Fort Wayne, Ind.

Filed Oct. 28, 1968, Ser. No. 771,233
Int. Cl. B60q *1/38*
U.S. Cl. 315—82 **6 Claims**



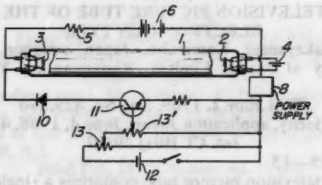
Variable intensity signaling apparatus for a vehicle having operating lamps operable in response to opening and closing of an operating lamp switch and also having stop signal lamps, turn signal lamps and hazard signal lamps operable independently of the operating lamp switch, the signaling lamp circuits including dimming resistances operable in response to operation of the operating lamp switch to vary the brilliance of the signal lamps. The material from which the resistances are formed is temperature sensitive, the resistance varying directly with the temperature.

3,603,841

FLUORESCENT LAMP DEVICE WITH LUMINOSITY CONTROL

Heima Yamada, Kyoto; Masashi Sangen, Kobe, and Kazumasa Nomi, Takatsuki-shi, all of, Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Feb. 25, 1969, Ser. No. 802,036
Claims priority, application Japan, Mar. 1, 1968, May 30, 1968, June 21, 1968, Aug. 30, 1968, Sept. 13, 1968, 43/16650; 43/45727; 43/53047; 43/75413; 43/79818
Int. Cl. H05b *37/00, 41/00*
U.S. Cl. 315—171 **4 Claims**



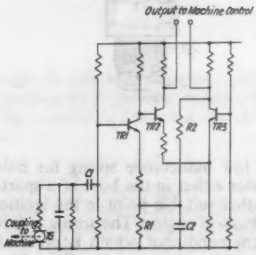
A fluorescent lamp device in which a DC power source of high voltage and small capacity is connected for maintaining a slight glow discharge within the lamp, a main current of the lamp being adjustably supplied from a main power source of large capacity and a rectifier is inserted into the main power circuit for blocking high voltages DC current flowing into the main circuit from the high-voltage source.

3,603,842

ACCELERATION CONTROL OF MACHINES

Bernard Edwin Ash, Bexleyheath, England, assignor to International Standard Electric Corp., New York, N.Y.

Filed Oct. 22, 1969, Ser. No. 868,565
Claims priority, application Great Britain, Nov. 7, 1968, 52771/68
Int. Cl. H02p *7/04*
U.S. Cl. 317—5 **2 Claims**



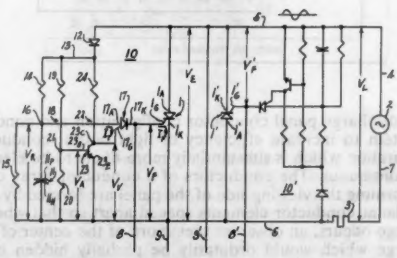
An acceleration control circuit for machinery includes a first transistor coupled to a tachogenerator on the machine to develop a signal proportional to rate of acceleration. An emitter coupled pair of transistors provides an output voltage to control the machinery, with a portion of the output fed back to increase the signal from the first stage. This permits a rapid response to small acceleration changes and a slower response to large changes.

3,603,843

TRANSIENT VOLTAGE PROTECTION CIRCUIT FOR GATE TURN ON DEVICES

Ralph E. Clements, Rockford, Ill., assignor to Barber-Colman Co., Rockford, Ill.

Filed June 17, 1969, Ser. No. 46,893
Int. Cl. H02h *3/20;* **H03k** *17/16*
U.S. Cl. 317—33 SC **10 Claims**

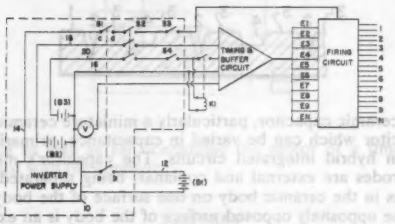


A circuit provides transient high voltage protection in a forward conducting direction to a nonconducting SCR by using the transient to generate a firing pulse for a unijunction transistor, permitting the discharge of a capacitor into the gate circuit of the SCR to turn on the latter before damage has occurred and allow the resultant power to be dissipated in the load.

3,603,844
ELECTRONIC DELAY MULTIPERIOD INITIATING SYSTEM

Fred A. Fritz, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed July 31, 1969, Ser. No. 846,398
Int. Cl. F23q 7/02
U.S. Cl. 317—80 5 Claims

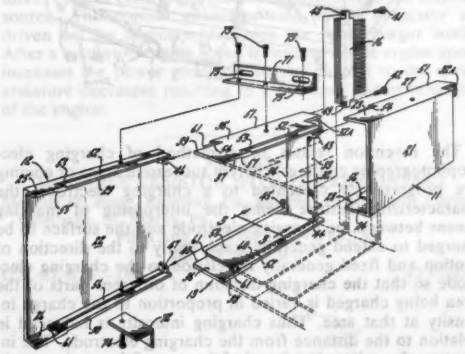


A device for providing electronically delayed multiple point initiating current to electrical initiators in blasting circuits is provided. The device has a plurality of firing circuits each of which employs a firing capacitor connected to a silicon controlled rectifier. A plurality of buffer circuits connected in parallel are provided, each buffer circuit having at least one capacitor which is connected to the control gate of a silicon controlled rectifier of a firing circuit. A timing circuit sequentially actuates discharge of each buffer capacitor into the gate of the silicon controlled rectifier of a corresponding firing circuit whereby the silicon controlled rectifier is made conductive allowing the firing capacitors to discharge into the firing circuit.

3,603,845
EXPANDABLE ENCLOSURE FOR PRINTED CIRCUIT CARDS AND THE LIKE

Howard L. Beers, River Forest, Ill., assignor to Wescom, Inc., Downers Grove, Ill.

Filed July 9, 1970, Ser. No. 53,461
Int. Cl. H05k 5/02; H02b 1/10
U.S. Cl. 317—117 12 Claims

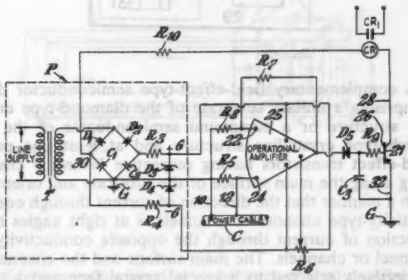


An expandable enclosure to house from one to several printed circuit cards and the like is assembled from a left- and a right-hand end section and, for multiple circuit cards, one or more center sections. Adjacent sections of the enclosure are interlocking, so that the only mechanical connectors required in the assembly are those that are required at any rate to mount the necessary electrical connectors. For over-and-under mounting of the enclosure on a conventional instrument or relay rack there are brackets which are horizontally adjustable relative to the rack but fixed relative to the enclosure, whereas for endwise mounting there are brackets that are fixed relative to the rack but vertically adjustable relative to the enclosure. Further for endwise mounting of the enclosure there are aligning pins extending laterally from either end of the enclosure and locating sockets on the brackets, such that the enclosure may be mounted without any skew relative to the rack by adjusting the vertical positions of the ends of the enclosure so that the aligning pins are received in corresponding ones of the locating sockets.

3,603,846
CURRENT DETECTOR CIRCUIT

Tibor Endre Toth, Bloomfield, N.J., assignor to Union Carbide, New York, N.Y.

Filed May 6, 1969, Ser. No. 822,202
Int. Cl. H01h 47/32
U.S. Cl. 317—123 9 Claims

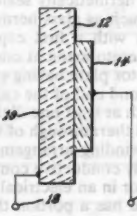


A solid-state current-detector circuit capable of detecting the presence of a predetermined magnitude of AC or DC current in a power cable wherein the current may vary over an extended range which includes means for sensing the voltage drop in a relatively short length of cable which means changes its electrical state when said voltage drop exceeds a predetermined level.

3,603,847
SCHOTTKY BARRIER PHOTODIODE WITH A DEGENERATE SEMICONDUCTOR ACTIVE REGION

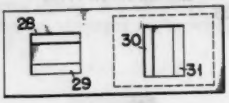
Freeman D. Shepherd, Jr., Chelmsford; Virgil E. Vickers, Cambridge, and Andrew C. Yang, Concord, all of, Mass., assignors to The United States of America as represented by the Secretary of the Air Force

Filed June 11, 1969, Ser. No. 832,111
Int. Cl. H01l 9/00, 15/00
U.S. Cl. 317—234 R 1 Claim



A Schottky barrier photodiode possessing a high quantum efficiency and adapted to operate at long wavelengths. The photodiode is fabricated by providing a nondegenerate semiconductor substrate of one extrinsic conductivity type with a thin layer of a degenerate semiconductor material of the same extrinsic conductivity type as said substrate to form a barrier junction therebetween. The improved quantum efficiency exhibited by the photodiode of this invention is attributed to the use of a degenerate material as the active region.

3,603,848
COMPLEMENTARY FIELD-EFFECT-TYPE SEMICONDUCTOR DEVICE
Tai Sato, Kohoku-ku, Yokohama-shi; Yoshiyuki Takeishi, Mitaka-shi, Tokyo; Yoshihiko Okamoto, Yokohama-shi, and Hisashi Hara, Kamakura-shi, Kanagawa-ken, all of, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Feb. 25, 1970, Ser. No. 14,174
Claims priority, application Japan, Feb. 27, 1969, 44/14217
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 7 Claims

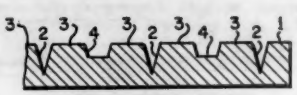


A complementary field-effect-type semiconductor device comprising a unitary substrate of the diamond-type crystalline structure or a compound semiconductor of the zinc-blende-type crystalline structure and at least one pair of field-effect transistors having respective N and P channels lying along the main surface of the substrate and oriented in such a manner that the direction of current through one conductivity-type channel or channels is at right angles to the direction of current through the opposite conductivity-type channel or channels. The main surface and the channels are respectively selected to a special crystal face and a crystal axis.

3,603,849
WOUND CAPACITOR TERMINAL CONNECTION ARRANGEMENT
David Kellerman, 1485 South Cardiff, Los Angeles, Calif.
Filed Aug. 3, 1970, Ser. No. 60,250
Int. Cl. H01g *1/14*
U.S. Cl. 317—260 16 Claims

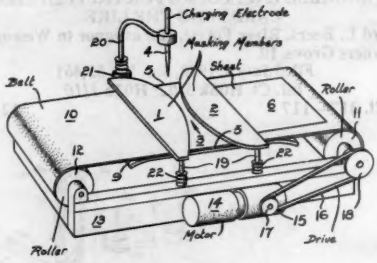
A wound capacitor is positioned within a metallic case and, if desired, may be hermetically sealed therein by a pair of dielectric end seals such as glass hermetic seals and has a capacitor-winding body with a first capacitor plate having electrical connection thereto made at one end of the capacitor and a second capacitor plate having electrical connection made thereto at the second end of the capacitor. The capacitor body is provided with at least one dielectric aperture substantially axially aligned therethrough of the type wound with a mandrel, bobbin or winding arrangement for aligning the capacitor. An electrically conductive contact is positioned on each end of the capacitor in an electrical contact with one of the capacitor plates and has a portion that extends into the aperture or apertures. An electrically conductive connector means extends through the dielectric end plates and has a portion extending into the aperture and electrical contact with the electrically conductive contact means therein. A comparatively short portion of the electrically conductive connector means extends outwardly from the outer surface of the capacitor end seal to which terminal wires or other leads may be connected after the completion of the manufacturing of the capacitor and the storing, handling and shipping thereof and upon installation of the capacitor in the circuitry for which it was designed. This provides a very low series resistance in the lead-to capacitor plate connections for AC applications.

3,603,850
CERAMIC CAPACITOR WITH COUNTERELECTRODE
John G. Kirschner, Northbrook, Ill., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.
Filed Nov. 14, 1969, Ser. No. 876,969
Int. Cl. H01g *3/06*
U.S. Cl. 317—261 7 Claims



A ceramic capacitor, particularly a miniature ceramic chip capacitor which can be varied in capacitance, primarily for use in hybrid integrated circuits. The capacitor's metallic electrodes are external and coplanar, being separated by a recess in the ceramic body on one surface of the body, and on the oppositely opposed surface of the body is an external metallic counterelectrode. The capacitor can be varied in capacitance by varying the surface area of the counterelectrode.

3,603,851
METHOD OF CONTOUR CHARGING
Kenneth A. Metcalfe, and Ian E. Smith, both of Lockleys, Australia, assignors to The Commonwealth of Australia, Canberra, Australia
Filed Oct. 31, 1969, Ser. No. 872,870
Claims priority, application Australia, Nov. 11, 1968, 46076/68
Int. Cl. G03g *15/02*
U.S. Cl. 317—262 A 7 Claims

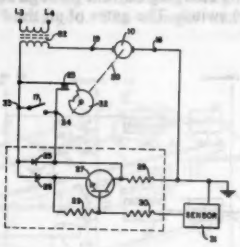


The invention relates to a method of charging electrophotographic coatings wherein successive areas of coating are progressively presented to a charging electrode, the characterizing feature being the interposing of masking means between the charging electrode and the surface to be charged to extend generally transversely to the direction of motion and fixed generally in relation to the charging electrode so that the charging duration of different parts of the area being charged is varied in proportion to the charge intensity at that area. Thus charging intensity is balanced in relation to the distance from the charging electrode. The invention also relates to control of the part of the corona used.

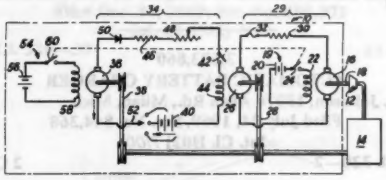
3,603,852
CONTROL SYSTEM PROVIDING DIRECTIONAL CURRENT FLOW TO A MOTOR FOR A TIMER
James A. Hirsch, and Robert F. Sheldon, both of Indianapolis, Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.
Division of Ser. No. 485,289, Sept. 7, 1965, Pat. No. 3,443,180.
Filed Dec. 30, 1968, Ser. No. 798,562
Int. Cl. H02p *1/58*
U.S. Cl. 318—102 2 Claims

A timer for controlling the operation of an appliance

which includes a means for controlling the motor of the appliance as well as for controlling the motor of a timer associated with the appliance.

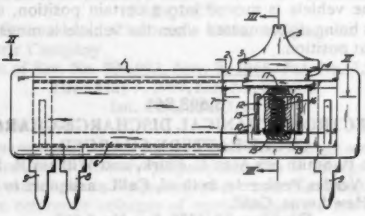


3,603,853
CONTROL SYSTEM FOR DIFFERENTIAL SUPERCHARGER
Anthony J. R. Mackay, Bremen, Germany, assignor to Aambeeld, N.V., St. Maarten, Netherlands, Antillen, a part interest
Filed July 30, 1969, Ser. No. 846,061
Int. Cl. H02p *5/20*
U.S. Cl. 318—146 **10 Claims**



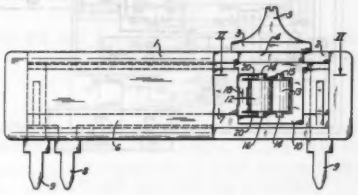
An electrical control system for a differential supercharger is disclosed which includes a power generator for providing armature current to the supercharger motor, and a control circuit for providing the field flux to the power generator, the control circuit having a constant direct current source and a direct current control generator in opposition to the constant source. The control generator and power generator are driven by the engine with which the supercharger works. After a minimum engine speed is reached as the engine speed increases the power generator output current to the motor armature decreases resulting in a decrease in supercharging of the engine.

3,603,854
VARIABLE RESISTOR WITH TILTED CONTACT
Mogens W. Bang, Ridgway, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.
Filed Aug. 9, 1970, Ser. No. 65,133
Int. Cl. H01c *9/02*
U.S. Cl. 338—183 **11 Claims**



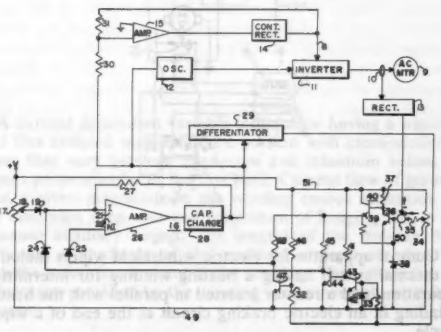
A slide is movable lengthwise between spaced parallel collector and resistance strips. Extending across the space between the strips is a carbon block that is connected to the slide by spring means urging the block to turn on an axis parallel to the strips to press two diagonally opposite areas of the block against the strips so that the block forms a bridging contact between them.

3,603,855
LINEAR MOTION VARIABLE RESISTOR WITH BRIDGING CONTACT IN SLIDE
Mogens W. Bang, Ridgway, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.
Filed Aug. 19, 1970, Ser. No. 65,134
Int. Cl. H01c *9/02*
U.S. Cl. 338—183 **9 Claims**



A slide is movable lengthwise between spaced parallel collector and resistance strips. The slide has a transverse opening through it, in which is disposed bridging contact means that project from opposite sides of the slide. Resilient means press the contact means and both the strips toward one another to hold them in engagement.

3,603,856
ACCELERATION-DECELERATION CURRENT LIMIT
David R. Zalar, Milwaukee, and Eugene L. Bilich, New Berlin, both of, Wis., assignors to The Louis Allis Company
Filed June 6, 1969, Ser. No. 830,961
Int. Cl. H02P *5/34*
U.S. Cl. 318—231 **7 Claims**

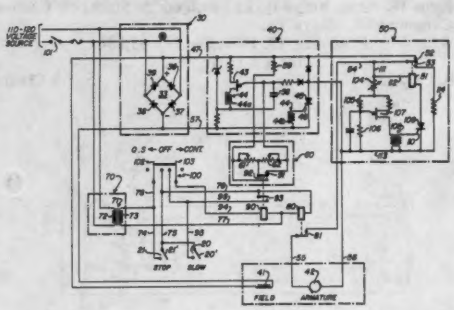


A current limit for an AC motor drive that is operative whenever motor speed change is commanded and motor current exceeds the current limit value. The rate of change of motor speed is controlled to maintain maximum motor current, i.e., motor current substantially equal to the current limit. This is achieved by moderating the rate of change command to the motor drive circuit in accordance with the amount of motor current in excess of the current limit.

3,603,857
SPEED CONTROL MECHANISM FOR REVOLVING DOORS

Harold E. Crane, 546 Timber Lake, Lake Forest, Ill., and Jack Lord, Des Plaines, Ill.

Filed Feb. 25, 1970, Ser. No. 13,951
Int. Cl. H02p 5/04
U.S. Cl. 318—302 4 Claims

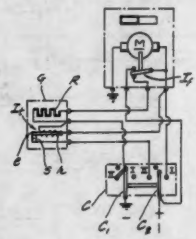


A speed control mechanism for controlling the operation of a motor used to rotate a revolving door, to prevent the latter from being rotated faster than a predetermined maximum speed of rotation. Control is established by sensing the speed of rotation of the door, and, if it exceeds the established predetermined speed, a resistance is connected across the armature of the motor driving the door, which resistance functions as a dynamic-braking means for the motor.

3,603,858
CONTROL MEANS FOR SELECTIVE CONTINUOUS AND INTERMITTENT OPERATION OF ELECTRIC WINDSHIELD WIPERS

Gilardelli Ugo, Milano, Italy, assignor to Fabbrica Italiana Magneti Marelli S.p.A., Milano, Italy

Filed June 11, 1969, Ser. No. 832,215
Claims priority, application Italy, June 11, 1968, 17571 A/68
Int. Cl. B60s 1/08
U.S. Cl. 318—443 3 Claims



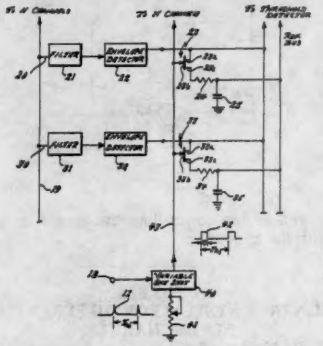
Control apparatus for electric windshield wipers including a thermal switch having a heating winding for intermittent operation, and a resistor inserted in parallel with the heating winding in an electric braking circuit at the end of a wiping cycle.

3,603,859
SYSTEM FOR MULTICHANNEL VARIABLE-TIME CONSTANT CONTROL

Robert J. McGee, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Air Force

Filed May 9, 1969, Ser. No. 823,425
Int. Cl. H02m 3/06; H03k 17/00
U.S. Cl. 320—1 2 Claims

A system for simultaneously varying the time constant of a plurality of RC networks over a continuous range of values with the time constant of all the RC networks over the full continuous range being the same. In the system each RC network receives its charging current through an FET (Field Effect Transistor) switch. The gates of all the FET switches are

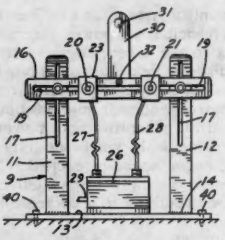


connected to a common bus which is driven by a variable monostable multivibrator. By proper selection of the multivibrator trigger frequency and multivibrator output, the RC time constant of each of the networks is simultaneously controlled.

3,603,860
AUTOMATIC BATTERY CHARGER

Paul J. Johnson, 15970 Allen Rd., Milan, Mich.

Filed July 24, 1969, Ser. No. 844,368
Int. Cl. H02j 7/00
U.S. Cl. 320—2 2 Claims



This application discloses an automatic battery charger for use with an electric automobile, golf cart, or any vehicle using a storage battery. The invention resides in the particular combination and arrangement of elements particularly a structure embodying a fixed male charging section, and a portable female section, which is carried on the vehicle. The sections being brought into mating and charging relation when the vehicle is moved into a certain position, and the sections being disconnected when the vehicle is moved away from that position.

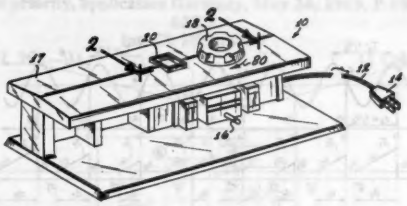
3,603,861
ELECTROMECHANICAL DISCHARGE-CHARGE CYCLE-BATTERY CHARGER

Frederic P. Smith Sta Max E. Shirk, and William R. Baynes, Palos Verdes Peninsula, both of, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 22, 1970, Ser. No. 5,007
Int. Cl. H02j 7/02
U.S. Cl. 320—14 10 Claims

This is a battery charger for rapidly recharging relatively small-capacity rechargeable batteries. The batteries are

recharged by being placed in electrical contact with terminals that are electrically coupled to a source of DC current, a current path being completed through the battery or batteries to be recharged. The charger includes a spring-



driven rotary switch that sequentially contacts a discharge terminal and then a charge terminal, the battery being thereby first discharged for a predetermined period of time and then charged for a predetermined period of time.

3,603,862

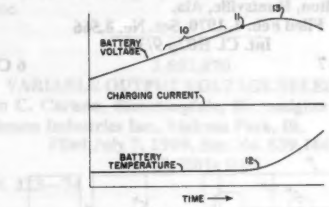
IMPROVED BATTERY-CHARGING CIRCUIT WITH LOCKING AND RESETTING MEANS

Robert F. Chase, Lynchburg, and Ralph R. Sherman, Jr., Forest, both of, Va., assignors to General Electric Company

Filed Dec. 22, 1969, Ser. No. 886,971

Int. Cl. H02j *7/10*

U.S. Cl. 320—39 **13 Claims**



A battery-charging circuit provides a main-charging current to a connected battery until the battery voltage reaches a selected magnitude, after which the charging circuit switches and provides a trickle-charge current to the battery. The charging circuit cannot provide main-charging current again until the battery is disconnected, and a battery subsequently connected to the charging circuit.

3,603,863

CIRCUITRY FOR GENERATING A SQUARE WAVE OF FIXED VOLTAGE AMPLITUDE AND VARIABLE FREQUENCY

Floyd Grossoehme, Cincinnati, Ohio, assignor to General Electric Company

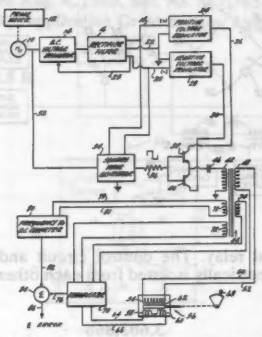
Division of Ser. No. 506,993, Nov. 9, 1965, Pat. No. 3,501,687.

Filed May 9, 1969, Ser. No. 870,832

Int. Cl. H02m *5/44*

U.S. Cl. 321—2 **2 Claims**

A square wave output signal has a fixed voltage amplitude and a frequency directly proportionate to a voltage source which varies both in frequency and amplitude. Positive and negative reference voltages of equal magnitude are derived from a power supply connected directly to the voltage source. These reference voltages are respectively applied to the collectors of a pair of transistors which are interconnected at their emitters. The common emitter connection is connected to the primary of a transformer. A square wave is generated from the power supply and applied to the bases of the two transistors, thereby generating a square wave input to



the transformer of fixed amplitude having a frequency corresponding to that of the voltage source.

3,603,864

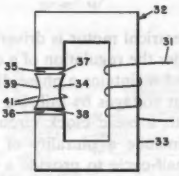
CURRENT DEPENDENT FILTER INDUCTANCE

Sherwood Thaler, Lexington, Mass., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 31, 1969, Ser. No. 889,555

Int. Cl. H01f *29/00;* **H02m** *1/14*

U.S. Cl. 321—10 **3 Claims**



A current dependent variable inductance having a winding and flux coupled magnetic core portion with cross-sectional areas that vary between maximum and minimum values in planes perpendicular to the flux path. Current flow of greater than a given magnitude in the winding causes saturation of the minimum core area and generation of fringing flux in an adjacent auxiliary airgap. The lengths of the fringing flux lines and accordingly of the auxiliary airgap vary directly with the saturation current in the winding. Thus, the value of inductance provided by the winding varies inversely with that current.

3,603,865

ELECTRONIC ANALOG FOR AN ELECTROMECHANICAL RELAY

Benjamin C. Liebenthal, La Grange, Ill., assignor to General Motors Corporation, Detroit, Mich.

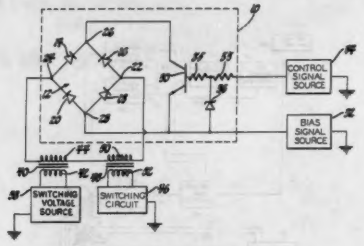
Filed Sept. 30, 1969, Ser. No. 862,433

Int. Cl. H02m *7/12*

U.S. Cl. 321—47 **1 Claim**

A static relay includes a control circuit which regulates the operation of a switching circuit. The control circuit performs the function of the control winding of a conventional elec-

tromechanical relay. The switching circuit performs the function of the switching contacts of a conventional electromechanical relay. The control circuit and the switching circuit are electrically isolated from each other.



3,603,866

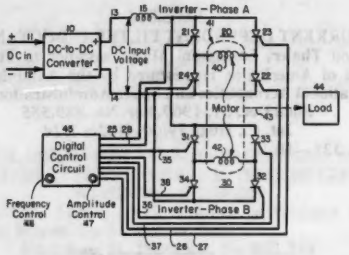
ENERGIZING SYSTEM WITH DIGITAL CONTROL CIRCUIT FOR REGULATING MULTIPHASE INVERTER

Kenneth E. Opal, 845 Fifth St., Oakmont, Pa.

Filed Mar. 24, 1970, Ser. No. 22,283

Int. Cl. H02m *7/48*

U.S. Cl. 321—45 R **11 Claims**



A two-phase electrical motor is driven by two separate inverter circuits under the regulation of a digital control circuit which provides and maintains a phase displacement between the inverter output voltages by utilizing a countdown circuit in connection with a basic clock circuit. The inverter AC output voltages include a plurality of pulses of the same polarity in each half-cycle to provide a resultant AC output voltage related to the clock frequency by another countdown circuit. Pulse duration is controlled to regulate the effective amplitude of the resultant AC output voltages. A chopper circuit prevents voltage swings in a varying DC supply from occurring in the DC input voltage which energizes the inverter circuits.

3,603,867

METHOD OF CONTROLLING A POLYPHASE INVERTER

Gerard Cuenoud, Grand-Lancy/Geneva, Switzerland, assignor to Battelle Memorial Institute, Carouge/Geneva, Switzerland

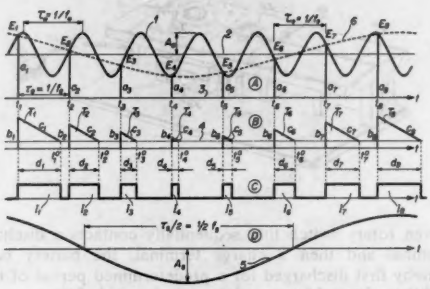
Filed June 9, 1970, Ser. No. 44,783

Claims priority, application Switzerland, June 9, 1969, 8769/69

Int. Cl. H02m *5/30*

U.S. Cl. 321—61 **11 Claims**

A method of controlling a polyphase inverter intended to supply a polyphase voltage whose frequency and amplitude must be variable independently. A sine wave of fixed frequency is generated and is sampled at a succession of instants at a frequency close to that of the sine wave. From this sampling is obtained a train of width-modulated pulses whose width corresponds to the amplitude of the sine wave at the successive sampling instants. Any variation in frequency of the sampling results in a corresponding variation in frequency of the pulse train and any variation in amplitude of the sine wave correspondingly affects the width of the pulses. As many such pulse trains as there are phases are produced and the leading and trailing edges of the pulses, which are independently variable by virtue of the sampling frequency and the amplitude of the sine wave being independent, are used to control the firing and extinction of rectifier elements in the inverter.



3,603,868

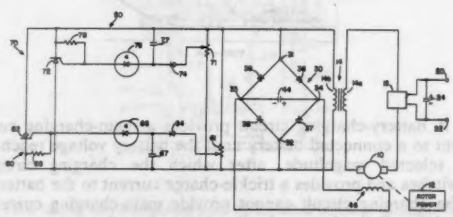
CONTROLLED FIELD ALTERNATOR CHARGING SYSTEM

Richard S. Milton, Huntsville, Ala.

Filed Feb. 4, 1970, Ser. No. 8,566

Int. Cl. H02p *9/30*

U.S. Cl. 322—7 **6 Claims**



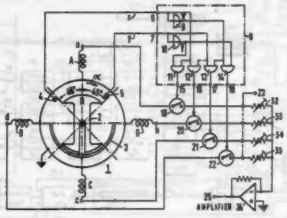
A control system for charging energy storage capacitors and for providing a source of constant current. The power source is a shaft-driven alternator. The alternator field is controlled by current from a current or control transformer. Energy is coupled from the alternator through the above current transformer to a control circuit and to a load bridge rectifier for conversion to direct current output energy. The energy that is coupled through the transformer secondary is connected through a diode bridge circuit to excite a field coil for controlling the alternator field. Energy is also coupled to an alternating current voltage level sensor that short circuits the current transformer secondary when the output energy is becoming excessive, thereby reducing the alternator field and the output voltage. The load bridge rectifier output is connected to a load capacitance for supplying a fixed DC voltage pulse for additional load circuitry. Load voltage regulation circuitry limits the load capacitor charge level by short circuiting the field coil when the desired voltage level is reached.

3,603,869

DEVICE FOR PRODUCING DIRECT VOLTAGE PROPORTIONAL TO SPEED

Ingemar Neuffer; Dieter Eichmann, and Frank Langweiler, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 15, 1970, Ser. No. 37,563
Claims priority, application Germany, May 24, 1969, P 19 26 628.5
Int. Cl. H02p 9/00
U.S. Cl. 322—31 11 Claims



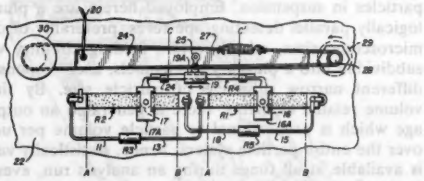
A rotatable actuator is mounted on the rotor of an AC machine for rotation therewith. A pair of spaced transmitters are stationarily mounted on the stator of the AC machine in operative proximity with the actuator. Each of the transmitters produces an output signal during the time the actuator passes in close proximity therewith. A control unit couples the transmitters to the control electrodes of a plurality of electronic switches connected to the stationary windings of the machine and controls the conductive condition of the switches. Unipolar phase voltages are cyclically applied to a common output connected in common to the switches and provide a direct voltage proportional to the speed of the machine.

3,603,870

VARIABLE OUTPUT VOLTAGE SELECTOR

Reuben C. Carlson, Bloomingdale, Ill., assignor to Standard Kollsman Industries Inc., Melrose Park, Ill.

Filed July 7, 1969, Ser. No. 839,166
Int. Cl. H01c 9/02
U.S. Cl. 323—74 8 Claims



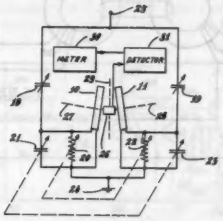
Variable output voltage selectors are disclosed herein. In one embodiment the two opposite terminals of an output potentiometer are connected individually with adjustable contactors of a pair of variable resistors that are connected in parallel between circuit points of differing constant voltage levels. A separate resistor is series connected with each of the variable resistors so that the resistive path of each of the variable resistors has a different voltage gradient profile. The contactors are ganged so that each traverses a corresponding distance along its resistor so that a variable voltage range can be effected between the contactors. The output pot has an output contactor adjustable to select a voltage level within the range of voltage determined by the position of the contactors of the pair of variable resistors. In another embodiment an output pot is connected between a pair of contactors which are adjustable in ganged relationship along a single resistive path having lengthwise nonlinear resistivity.

3,603,871

NUCLEAR MAGNETIC RESONANCE PROBE

Jeffrey Malcolm Caunter, Beaconsfield, and Peter Higham, High Wycombe, both of, England, assignors to Perkin-Elmer Limited, Beaconsfield, England

Filed Aug. 4, 1969, Ser. No. 847,363
Claims priority, application Great Britain, Aug. 9, 1968, 38051/58
Int. Cl. G01n 27/78
U.S. Cl. 324—0.5 R 9 Claims



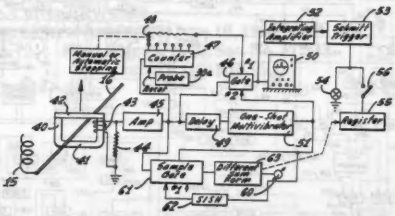
A predetermined amount of electromagnetic intercoupling is provided between segments of a transmitter winding and a receiver winding in a probe for a nuclear magnetic resonance apparatus. Circuit means are provided for adjusting the amplitude and phase of voltages induced in the receiver winding by each transmitter winding segment causing the induced voltages to oppose and to thereby reduce a standing signal in the receiver winding.

3,603,872

APPARATUS USING CURRENT SIGNALS TO ANALYZE THE IGNITION OF AN ENGINE

Edmond R. Pelta, Pacific Palisades, Calif., assignor to Autoscan, Inc., Los Angeles, Calif.

Filed Apr. 9, 1970, Ser. No. 24,429
Int. Cl. G01m 15/00
U.S. Cl. 324—16 23 Claims



This invention relates to a system for testing the ignition system of an automobile engine. The system develops a first current pulse when the voltage across the distributor gap for each cylinder in the engine breaks down. The system develops a second current pulse when the gap in the spark plug for each cylinder in the engine breaks down. Means are provided for determining whether each individual spark plug is operating properly. Means are also provided for determining the characteristics of the spark plug signal.

3,603,873

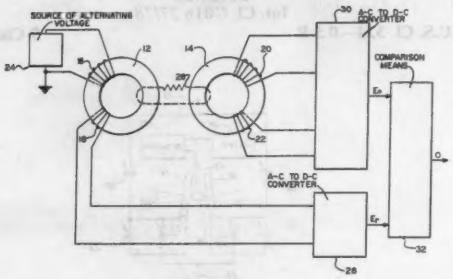
CONDUCTIVITY SENSOR

Uldis Cirulis, Midland Park, N.J., assignor to Nus Corporation, Rockville, Md.

Filed Jan. 14, 1970, Ser. No. 2,910
Int. Cl. G01n 27/42
U.S. Cl. 324—30 R 14 Claims

A conductivity sensor having a fluid immersible, conductivity transformer comprised of a pair of toroidal cores on

each of which are wound two windings, one of the windings on one core being the input winding, one of the windings on the other core being the output winding, the second winding on the input core providing a reference voltage and the second winding on the output core providing a means for



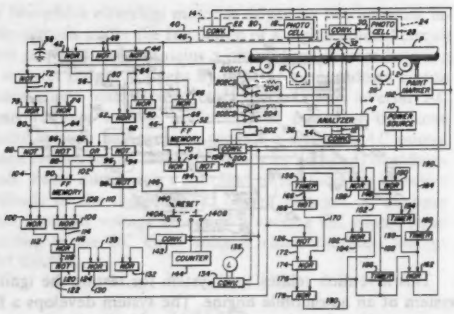
negative feedback to null the flux in the second core. The output voltage and the reference voltages are compared to produce a measurement which is a function of the conductivity of the medium in which the conductivity transformer is immersed.

3,603,874

EDDY CURRENT INSPECTION DEVICE FOR ELONGATED MATERIAL WITH MEANS TO ELIMINATE THE END EFFECT

William L. Posey, Lorain, Ohio, assignor to United States Steel Corporation

Filed June 9, 1969, Ser. No. 831,410
Int. Cl. G01r *33/12*
U.S. Cl. 324—40 **10 Claims**



A control circuit for eddy current inspection of moving lengths of steel pipe has continuously energized primary encircling coils inducing eddy currents in the pipe. When a length of pipe enters the two encircling sensing coils, which detect differences in eddy currents as material discontinuities, the first sensing signals are attenuated. A defect-marking system, which marks according to the location of sensed material discontinuities, excludes the signals resulting from the entrance and exit of the pipe through the coils.

ERRATUM

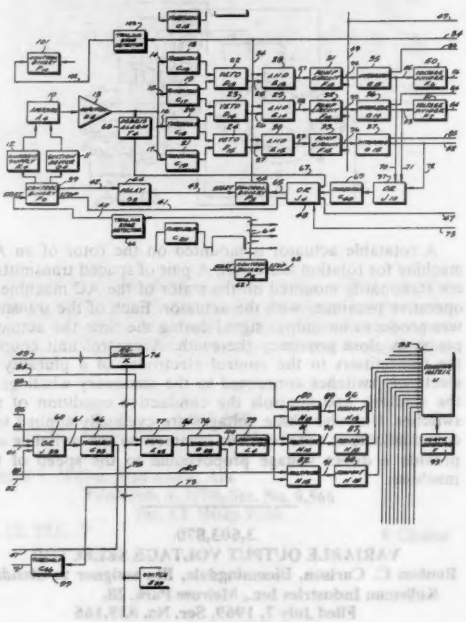
For Class 324—62 see:
Patent No. 3,602,952

3,603,875

PARTICLE ANALYZING METHOD AND APPARATUS EMPLOYING MULTIPLE APERTURES AND MULTIPLE CHANNELS PER APERTURE

Wallace H. Coulter, Miami Springs, and Walter R. Hogg, Miami Lakes, both of, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of application Ser. No. 527,146, Feb. 14, 1966, now Patent No. 3,444,463, dated May 13, 1969. This application May 12, 1969, Ser. No. 823,743
Int. Cl. G01n *27/00*
U.S. Cl. 324—71 R **35 Claims**



Disclosed is an improved method and apparatus for analyzing particles by the Coulter principle of employing an impedance responsive detecting aperture through which pass particles in suspension. Employed herein are a plurality of logically parallel detecting apertures, preferably of different microscopic sizes, each aperture feeding circuitry which is subdivided into a plurality of channels, each responsive to a different narrow subrange of particle size. By time and volume related elements, there is generated an output voltage which is proportional to particle volume per unit time over the entire particle system; hence, statistically valid data is available at all times during an analysis run, even in the event of a malfunctioning blockage of an aperture.

3,603,876

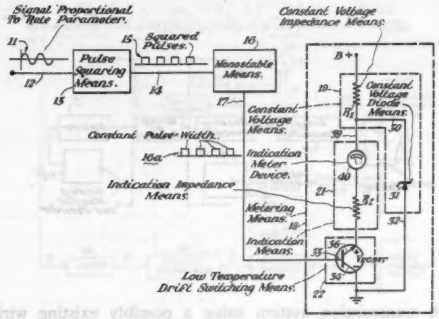
HIGH SPEED RATE INDICATOR HAVING IMPROVED METERING CIRCUIT

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Nov. 25, 1969, Ser. No. 879,732
Int. Cl. G01r *23/02*; G01p *3/12*; G01r *11/18*
U.S. Cl. 324—78 J **1 Claim**

This disclosure relates to a high rate parameter measuring system which uniquely allows extremely accurate rate measuring due to removal of indication nonlinearity as well as the removal of inaccuracies due to reading over wide ranges of ambient temperatures which are intrinsic to the environment of said system. The system incorporates pulse-squaring circuitry which square incoming rate pulses indicative of said rate parameter, associatively coupled to monostable circuitry

including an operational amplifier which monostable circuitry provides a constant pulse-width output, said pulse-width output, said monostable circuitry output electrically coupled to a metering circuit which produces a linear indication of the rate of said incoming rate pulses and includes a solid state semiconductive component which uniquely cooperates with the aforementioned components to provide the desired results.

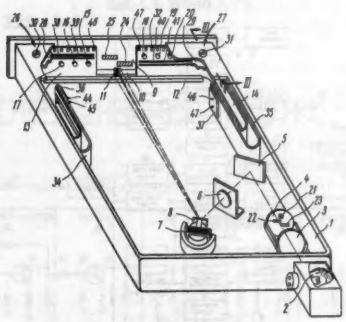


3,603,877

LIGHT-CONTACT PHOTOSENSITIVE MEASURING INSTRUMENT WITH SCALE RANGE INDICATORS

Jury Alexandrovich Alexeev, Zheleznovodskaya ul., 21, kv. 6; Boris Abelevich Seliber, Rentgena, 15/31, kv.53, and Vladimir Bakirovich Usmanov, Bolshaya Porokhovskaya, 41, kv. 33, all of Leningrad, U.S.S.R.

Filed June 19, 1969, Ser. No. 834,639
Int. Cl. G01r *13/38, 15/08*
U.S. Cl. 324—97 **5 Claims**



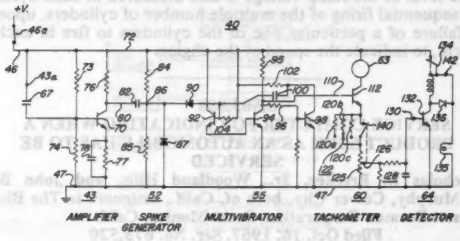
A light-contact measuring instrument comprising a movement with a rotatable mirror for directing a light beam through an optical system producing pointer beams, of which a major pointer beam is projected onto a scale and an auxiliary pointer beam onto light-sensitive elements capable of moving along the scale, in which the light-sensitive elements are disposed on flexible bands associated with driving means for moving the bands along the scale and carrying current leads disposed along the bands for connecting the light-sensitive elements to an external control circuit.

3,603,878

SPEED-MONITOR SYSTEM AND METHOD USING IMPULSIVE IGNITION NOISE

Joseph M. Himmelstein, 120 Norwood Avenue, Long Branch, N.J.

Filed Feb. 25, 1969, Ser. No. 802,139
Int. Cl. G01p *3/48*
U.S. Cl. 324—169 **1 Claim**



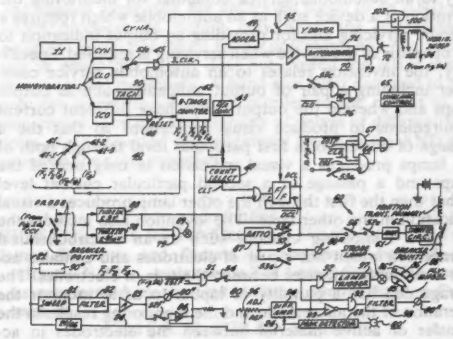
A speed monitor system using impulsive ignition noise in the form of a periodic sequence of noise bursts which is present on the power distribution buss of a motor vehicle. The noise burst are amplified and a pulse is produced for each noise burst to develop a sequence of pulses. An output signal is generated proportional to the time rate of the sequence of pulses and is therefore proportional to the engine speed.

3,603,879

APPARATUS FOR MEASURING THE FREQUENCY OF OCCURENCE OF IGNITION SIGNALS IN A MULTICYLINDER ENGINE

Edmond R. Pelta, Pacific Palisades, and Kenneth Stewart Gold, Canoga Park, both of, Calif., assignors to Autoscan, Inc., Culver City, Calif.

Division of Ser. No. 556,710, June 10, 1966.
Filed May 15, 1970, Ser. No. 37,533
Int. Cl. G01p *3/56*
U.S. Cl. 324—161 **22 Claims**



A ramp voltage is provided to a particular amplitude upon each occurrence of an ignition signal for a cylinder in a mul-

ticylinder engine. The slope of the ramp voltage is changed as the rate of occurrence of the ignition signals in the multicylinder engine varies. When the amplitude of the ramp voltage reaches the particular level, the ramp voltage is terminated until the occurrence of the next ignition signal. A sweep is produced in accordance with the ramp voltage.

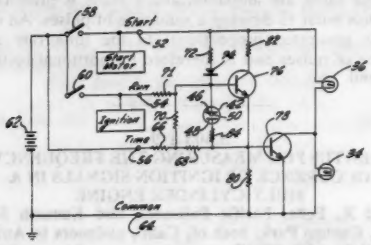
When the frequency or angular velocity of the multicylinder engine is to be tested, the ramp voltage is produced at the same slope as in the previous paragraph. However, the ramp voltage is produced to a level dependent upon the rate of occurrence of ignition signals. The level of this ramp voltage indicates the rate of occurrence of the ignition signals. The level of the ramp voltage is also measured in each cycle of sequential firing of the multiple number of cylinders, upon a failure of a particular one of the cylinders to fire in each cycle, to indicate the speed of the engine.

3,603,880

SERVICE COMPUTER FOR INDICATING WHEN A PRODUCT SUCH AS AN AUTOMOBILE HAS TO BE SERVICED

Nicholas L. Brecker, Jr., Woodland Hills, and John B. Murphy, Culver City, both of, Calif., assignors to The Bissett-Berman Corporation, Santa Monica, Calif.

Filed Oct. 16, 1967, Ser. No. 675,520
Int. Cl. G04f 9/00; G08b 21/00
U.S. Cl. 324—182 **11 Claims**



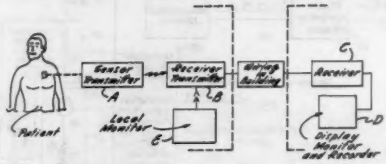
This invention relates to a service computer and specifically to an automobile service computer for monitoring the operation of a device such as an automobile which requires a periodic servicing and for providing an output indication to the operator of the device when servicing is required. Specifically, the invention relates to an automobile service computer including a pair of output indicators such as output lamps and wherein the output lamps have different current requirements to produce visual indications so that the a passage of current of a first particular level through both of the lamps produces a visual indication in only one of the lamps and a passage of a second particular current level higher than the first through the other lamp produces a visual indication in the other lamp. The invention also includes the use of a computing element such as an electrochemical storage cell which has a pair of electrodes and contains active material for transfer between the pair of electrodes. The storage cell has a plurality of inputs so as to monitor the operation of the automobile and the monitoring results in the transfer of active material between the electrodes in accordance with the operation of an automobile. When all of the active material has been transferred from one of the electrodes, the resistance across the electrodes in the storage cell increases and this increase in resistance is used to control the application of current to either one or both of the output lamps thereby providing the output indication to the operator of the device.

3,603,881

FREQUENCY SHIFT TELEMETRY SYSTEM WITH BOTH RADIO AND WIRE TRANSMISSION PATHS

William E. Thornton, Santa Monica, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.

Filed Mar. 1, 1968, Ser. No. 709,569
Int. Cl. A61b 5/04
U.S. Cl. 325—30 **3 Claims**



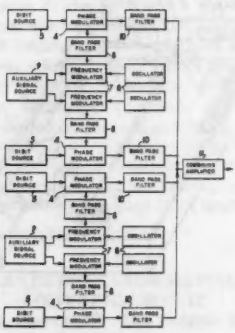
A transmission system using a possibly existing wiring system for transmitting RF signals and covering short distances away from the wiring system through VHF transmission. In hospitals, physiological data are transmitted from a sensor VHF transmitter to a fixed VHF receiver RF transmitter coupled to the wiring system in the building. A RF receiver demodulator monitor is coupled to wiring system at the nurses' station. The system is particularly designed for noise suppression.

3,603,882

PHASE SHIFT DATA TRANSMISSION SYSTEMS HAVING AUXILIARY CHANNELS

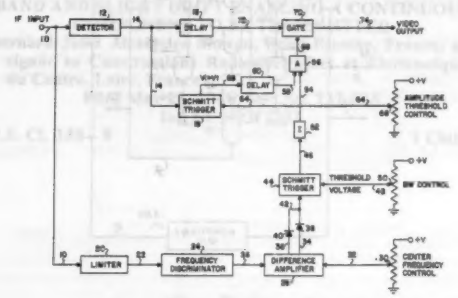
Bernard Wilson, Coventry, England, assignor to General Electric and English Electric Companies Limited, London, England

Filed Apr. 16, 1969, Ser. No. 816,533
Claims priority, application Great Britain, Apr. 17, 1968, 18129/68
Int. Cl. H04b 1/00
U.S. Cl. 325—47 **4 Claims**



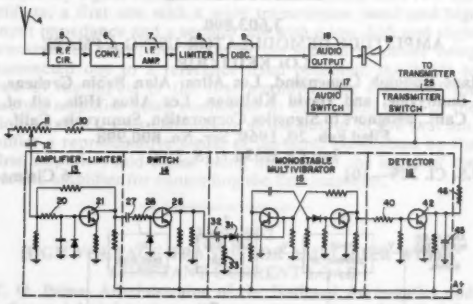
In a data transmission system utilizing phase shift modulation of a carrier signal to transmit pulse coded data from one station to another an auxiliary low frequency signal is transmitted between said stations by frequency modulation of the carrier signal, the maximum phase shift of the carrier signal due to said frequency modulation during any one pulse interval of the data signals being much less than the minimum step phase shift utilized in transmitting said data.

3,603,883
PULSE SEPARATION CIRCUIT
Francis L. Burnham, Silver Spring, Md., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.
Filed Mar. 28, 1968, Ser. No. 716,770
Int. Cl. H04b 1/10
U.S. Cl. 325—324 **9 Claims**



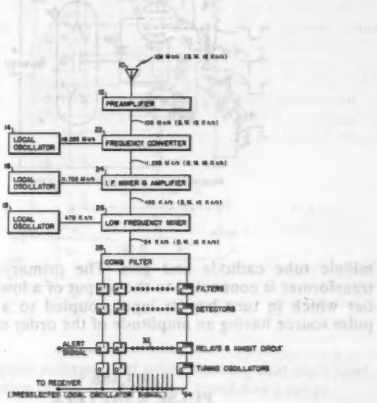
A circuit for separating pulses received on a selected carrier frequency from an environment containing pulses on a plurality of different carrier frequencies which circuit includes a first circuit for generating an output value, such as a voltage level, which is proportional to the frequency of the received input, a second circuit for comparing the output from the first circuit with a value proportional to the selected carrier frequency, and gating means which is operative in response to a match in the comparing circuit for selecting and passing received pulses. Means may be provided for indicating a bandwidth around the selected carrier frequency in which pulses are to be selected and means for permitting the gating means to pass pulses received on carriers within the bandwidth.

3,603,884
SPEECH-NOISE DISCRIMINATING CONSTANT PULSE WIDTH SQUELCH
Paul J. Zaura, Jr., Glen Ellyn; George C. Hawkins, Hanover Park, and Gary A. Cannalte, Hoffman Estates, all of, Ill., assignors to Motorola, Inc., Franklin Park, Ill.
Filed June 4, 1969, Ser. No. 830,350
Int. Cl. H04b 1/10
U.S. Cl. 325—348 **6 Claims**



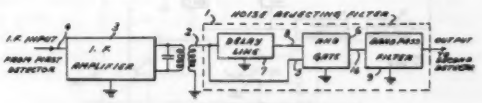
A squelch circuit for a receiver wherein the detected signals at the discriminator are amplified and converted to pulses of constant period or width. The pulses are detected and used to develop a control voltage to actuate an audio or transmitter switch. A decrease in the noise signal due to the presence of a proper radio frequency signal will decrease the pulse rate, increase the control voltage and actuate the switches allowing the audio signal to pass through the audio stages of the receiver and activating an associated transmitter.

3,603,885
SPECTROGRAPHIC IF PRESELECTOR
Charles A. Bartholomew, and Roger L. Easton, both of Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy
Filed Mar. 30, 1965, Ser. No. 444,519
Int. Cl. H04b 1/16
U.S. Cl. 325—432 **8 Claims**



A device for automatically tuning interferometer-type receivers in a space surveillance system comprising receiving means, a comb filter comprising a plurality of channels, each including a filter, and a tuning means connected to each filter.

3,603,886
NOISE REJECTING SIGNAL FILTER
Gene M. Norrs, R.D. #1, Verona, N.Y.
Filed Jan. 4, 1966, Ser. No. 518,730
Int. Cl. H04b 1/10
U.S. Cl. 325—476 **5 Claims**

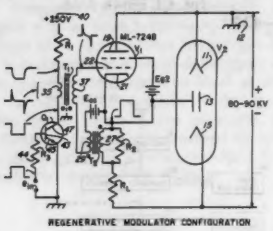


A noise rejecting network for radio signals in which the signal is delayed by a multiple of the carrier wave half-period and applied along with the undelayed signal to an AND gate which produces an output only when the instantaneous polarities of the two inputs have a predetermined relationship and in which the output does not exceed the lesser instantaneous signal magnitude. A band-pass filter designed to pass only the signal frequencies is coupled to the output of the gate circuit. The use of a plurality of delays of different multiples of a half-period with additional inputs to the AND gate increases the noise rejection.

3,603,887
HIGH VOLTAGE REGENERATIVE PULSE MODULATOR
James D. Doss, and Donald C. Hagerman, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission
Filed Feb. 12, 1970, Ser. No. 10,969
U.S. Cl. 328—59 **5 Claims**

Apparatus for generating a rectangular wave positive pulse having an amplitude of 80 kilovolts or more in response to low voltage timing signal pulses in which a thermionic tube has its cathode connected to one terminal of one winding of a feedback transformer and the other terminal is connected to negative high voltage through a load resistor, and the

other winding of the transformer is connected in series with the secondary winding of a high voltage input transformer and the series circuit so constructed is connected to the thermionic tube cathode and grid. The primary of the input transformer is connected to the output of a low power amplifier which in turn has its input coupled to a timing signal pulse source having an amplitude of the order of 10 volts.

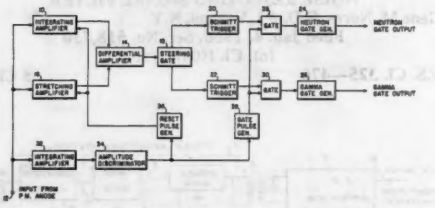


3,603,888

PULSE ANALYZER

Dallas W. Jones, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 25, 1969, Ser. No. 802,081
Int. Cl. G03k *5/20*
U.S. Cl. 328—112 **4 Claims**



A pulse analyzer comprising an integrating amplifier having its input coupled in common with the input of a stretching amplifier. The outputs of the amplifiers are coupled to respective inputs of a differential amplifier having its output coupled to a steering gate which separates positive and negative pulses for further processing by wave shaping circuits. The analyzer separates input pulses which deliver a large total charge from those which deliver a small total charge for the same initial peak current.

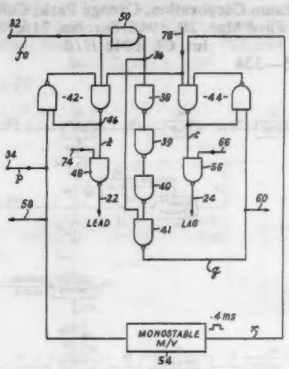
3,603,889

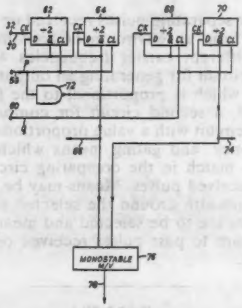
PHASE COMPARATOR USING FLIP-FLOP CIRCUITS

Michael Charles Stevens, Broxbourne, and Brian David Swatton, Harlow, both of, England, assignors to A. C. Cossor Limited, Essex, England

Filed Apr. 16, 1969, Ser. No. 816,587
Claims priority, application Great Britain, May 8, 1968, 21766/68
Int. Cl. H03b *3/04*; H03d *13/00*; H03k *9/06*
U.S. Cl. 328—133 **4 Claims**

A bistable flip-flop is set and reset respectively by two signals whose phases are to be compared and provides pulses of width determined by the phase difference. In order to prevent erroneous indication of phase synchronism when one signal frequency is an integral multiple of the other, a frequency comparator blocks the flip-flop when the frequencies are different and itself provides the said pulses, instead of the flip-flop.





ERRATUM

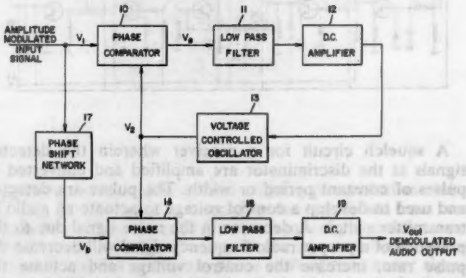
For Class 328—134 see:
Patent No. 3,602,994

3,603,890

AMPLITUDE DEMODULATOR USING A PHASE LOCKED LOOP

Hans Rudolph Camenzind, Los Altos; Alan Bebin Grebene, Sunnyvale, and David Kleitman, Los Altos Hills, all of, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Feb. 20, 1969, Ser. No. 800,998
Int. Cl. H03d *1/18, 3/00*
U.S. Cl. 329—101 **6 Claims**



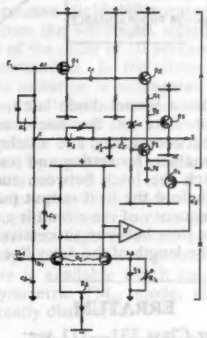
An amplitude demodulator suitable for integration including a phase locked loop which provides a frequency equal to

the carrier frequency of the amplitude modulated signal, in phase components of such two signals being multiplied together to provide, after filtering, the original modulating signal.

3,603,891
AMPLIFYING DEVICE WITH WIDE TRANSMISSION BAND AND SLIGHT DRIFT ENABLING A CONTINUOUS COMPONENT TO BE TRANSMITTED

Bernard Jules Alexandre Simeau, Saint-Etienne, France, assignor to Constructions Radioelectriques et Electroniques du Centre, Loire, France

Filed May 28, 1968, Ser. No. 732,733
Int. Cl. H03f *1/02*
U.S. Cl. 330—9 **1 Claim**



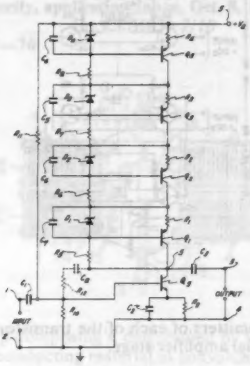
An amplifying arrangement having a wide transmission band and slight drift which enables a continuous high frequency signal component to be transmitted uses two amplifiers, a first one with a wide transmission band and high input impedance and a second one with a low drift and slight transmission band, the inputs of the second amplifier being connected one to a reference fixed potential, the other to one of the inputs of the first amplifier, the output of the second amplifier being connected to the second input of the first amplifier, thus elaborating at the output of the first amplifier a representative signal of the error committed by the first amplifier, said signal being injected in the input of the second amplifier for controlling the first amplifier.

3,603,892
HIGH VOLTAGE TRANSISTOR AMPLIFIER WITH CONSTANT CURRENT LOAD

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; John E. Guisinger, Los Angeles, and George W. Lewicki, Los Angeles, Calif.

Filed Oct. 10, 1969, Ser. No. 865,274
Int. Cl. H03f *3/42*
U.S. Cl. 330—18 **2 Claims**

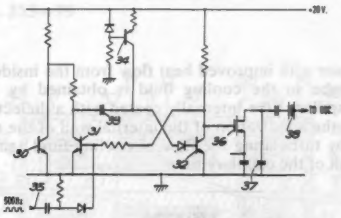
An amplifying circuit is disclosed wherein a constant current source is used as the collector load for an output amplifying transistor to provide high gain voltage amplification. The amplifying circuit has an high output impedance operable from a high DC supply voltage. The constant current source in one embodiment comprises a plurality of cascade connected transistors, having their base bias' fixedly determined by either diodes or voltage cells. The number of cascade connected transistors may be varied to accommodate any supply voltage level while insuring that each load transistor operates below its avalanche breakdown range.



3,603,893
PHASE LOCKED OSCILLATORS

David Geoffrey Hughes, London, England, assignor to Decca Limited, London, England

Filed Aug. 3, 1970, Ser. No. 60,536
Claims priority, application Great Britain, Oct. 14, 1969, 50542/69
Int. Cl. H03b *3/06*
U.S. Cl. 331—17 **14 Claims**



A phase-locked oscillator has an oscillator unit switchable between two frequencies, the switches being controlled by a switching control signal in the form of pulses at a regular repetition rate, said pulses having a duration relative to the repetition period linearly proportional to the amplitude of an integrated phase error signal. The oscillator unit is thus switched regularly between its two frequencies, the relative duration of the operation on each frequency being controlled whereby the mean oscillator frequency is controlled to hold the required phase lock, a high degree of linearity between controlling voltage and average output frequency.

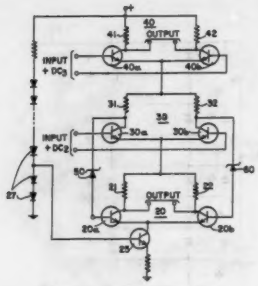
3,603,894
STACKED DIFFERENTIAL AMPLIFIERS

Gildo Cecchin, Niles, and Francis H. Hilbert, River Grove, both of, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 8, 1969, Ser. No. 848,635
Int. Cl. H03f *3/68*
U.S. Cl. 330—30 **5 Claims**

A cascaded train of transistor differential amplifier circuits are operated with a single primary constant current source connected to the first amplifier of the train. The constant current sources for each of the other differential amplifiers

are obtained by recombining the signals present on the collectors of the transistors in the next preceding amplifier in



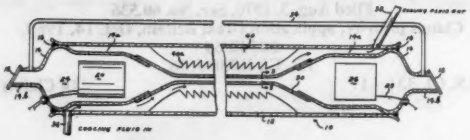
common to the emitters of each of the transistors in the subsequent differential amplifier stage.

3,603,895

GAS LASERS WITH IMPROVED CAPILLARY TUBE

Gustav K. Medicus, 7521 Hyland Avenue (W), Dayton, Ohio

Division of Ser. No. 449,653, Apr. 20, 1965, Pat. No. 3,394,320
Filed May 6, 1968, Ser. No. 726,968
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **1 Claim**



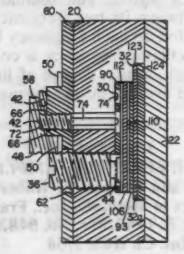
A gas laser with improved heat flow from the inside of the capillary tube to the cooling fluid is obtained by using a metallic capillary tube internally coated with a dielectric film formed by the anodization of the internal wall of the metallic tube and by turbulating the flow of cooling fluid against the outside wall of the capillary tube.

3,603,896

MICROWAVE PRINTED CIRCUIT NEGATIVE RESISTANCE OSCILLATOR

Richard Calvin Havens, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 30, 1969, Ser. No. 889,133
Int. Cl. H03b *7/14*
U.S. Cl. 331—96 **11 Claims**



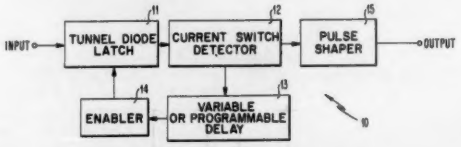
An oscillator is disclosed in which the high frequency, as well as a portion of the direct current circuitry, is printed on both sides of a thin sheet of dielectric, the printed circuit being enclosed in a chamber having conductive walls, and in which the frequency and the output power are adjustable by adjusting the position of sapphire rods with respect to the printed circuit.

3,603,897

PULSE CIRCUIT EMPLOYING DELAY LINE TO DELIMIT OUTPUT FREQUENCY

Stanley J. Grubel, Wappingers Falls; Joseph E. La Rou, Fishkill, and Hugh R. Stirling, Poughkeepsie, all of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 2, 1969, Ser. No. 829,632
Int. Cl. H03b *7/08*
U.S. Cl. 331—107 T **3 Claims**



The circuit includes a tunnel diode latch, a detector for sensing the level or state of the latch, an enabler for switching the latch between states, and a delay line coupling the detector to the enabler, for setting and resetting the enabler to thereby switch the latch between states. Since the latch must be reset before the next output pulse can be obtained, the output frequency of the circuit is a function of the delay line length, the time between successive output signals being at least twice the length of the delay line.

ERRATUM

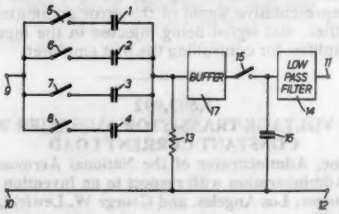
For Class 331—111 see:
Patent No. 3,603,906

3,603,898

N-PARALLEL-PATH CAPACITIVE SWITCHED FILTER IN WHICH ONLY INCOMPLETE SPACED PORTIONS OF INPUT SIGNAL ARE SAMPLED

John Howard Dawson, Chelmsford, and David George Francis Fripp, Beckenham, both of, England, assignors to The Marconi Company Limited, London, England

Filed Feb. 2, 1970, Ser. No. 7,794
Claims priority, application Great Britain, Mar. 14, 1969, 13421/69
Int. Cl. H03h *7/04*
U.S. Cl. 333—70 A **12 Claims**



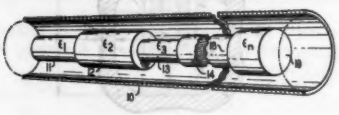
The invention provides a band-stop filter including a plurality n of switchably selectable capacitive parallel paths. Switch means are provided for sequentially and selectively selecting the paths, the switch means being controlled to select each path for a period of time which is less than $1/n$th (usually $1/4n$) of the period of a complete switching sequence of all of the paths.

3,603,899

HIGH Q MICROWAVE CAVITY

Ernst M. Gyorgy, Madison; Raymond E. Jaeger, Basking Ridge, and Harold Seidel, Warren Township, Somerset County, all of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 18, 1969, Ser. No. 817,355
Int. Cl. H03h 9/00
U.S. Cl. 333—73 W 6 Claims



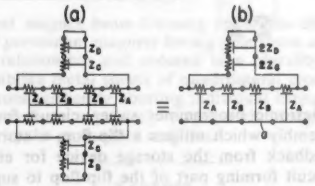
A low loss microwave transmission structure composed of a section of waveguide within which is concentrically placed an array (one or more) of cylindrical sections of dielectric material with relative dielectric constant greater than four, spaced away from the walls by a significant fraction of the radius (at least of the order of 10 percent) and possessing appreciable discontinuities. In the dielectric loaded sections electromagnetic radiation is propagated primarily within the dielectric so that the losses observed are mainly a function of the dielectric material and are, to first order, insensitive to the wall composition or condition. In this most general form the structure can by synthesized as a low loss filter or equalizer. When operated at frequencies at which the unloaded waveguide is below cutoff a high-Q cavity can be formed. A single section cavity of this type has been used to measure the Q of the low loss high dielectric constant dielectrics. A particularly simple and easily adjustable coaxial input and output structure is available which couples strongly to the cylindrically symmetric TM_{01} mode, all other propagating modes being greatly disfavored.

3,603,900

DISTRIBUTED CONSTANT RC NETWORK

Kozo Hatori, Sapporo; Hitoshi Watanabe, Tokyo, and Nobuyoshi Yoshida, Tokyo, all of, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Oct. 7, 1968, Ser. No. 765,580
Claims priority, application Japan, Oct. 9, 1967, 42/64783
Int. Cl. H03h 7/06
U.S. Cl. 333—75 13 Claims



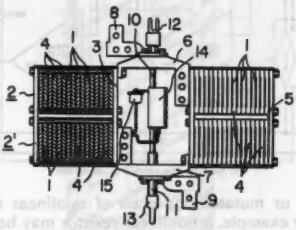
Distributed constant RC network apparatus is provided in accordance with this invention having a pair of complex attenuation poles which reside on the plane defined by the complex angular frequency $s=\gamma+j\omega$. According to this invention a plurality of fundamental circuit means containing various unit elements of a distributed constant RC network are developed. Thereafter, two or more of such plurality of fundamental circuit means may be combined in a predetermined manner to form various embodiments of uniform equal length distributed constant RC network apparatus, according to this invention, having a pair of complex attenuation poles located on an arbitrary point on the plane defined by the complex angular frequency.

3,603,901

LINE TRAP

Kazutoshi Matsumoto, Yokohama, Japan, assignor to Nippon Koei Company, Limited, Tokyo, Japan

Filed Sept. 29, 1969, Ser. No. 861,780
Claims priority, application Japan, Oct. 8, 1968, 43/73312
Int. Cl. H03h 7/10
U.S. Cl. 333—76 1 Claim



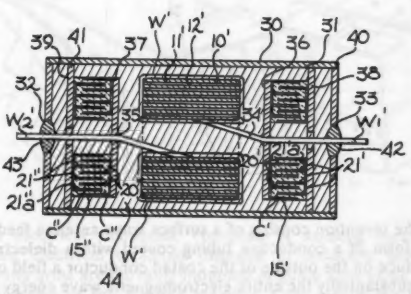
A line trap comprising a coil formed by winding a strip of electrically conducting material in convolutions, a supporting frame made of an insulating material for supporting the convolutions of said strip, a spacer for controlling the clearance between the convolutions of the strip, a pair of trap terminals each connected to one of the opposite ends of said coil, and tuning means and an arrester connected in shunt with said coil.

3,603,902

MINIATURE BROAD BAND LOW PASS FILTERS WITH MULTITURN TAPE WOUND INDUCTORS

Peter A. Denes, 9101 Crestwood Ave. N.E., Albuquerque, N. Mex.

Continuation-in-part of application Ser. No. 393,946, Sept. 2, 1964, now Patent No. 3,456,215, and a continuation-in-part of Ser. No. 831,142, June 6, 1969. This application July 14, 1969, Ser. No. 841,234
Int. Cl. H03h 7/02
U.S. Cl. 333—79 10 Claims



A miniature broadband high frequency low pass filter having at least one multiturn tape wound core inductor and at least one ceramic capacitor whereby the resultant filter exhibits improved insertion loss characteristics even in filter applications having certain amounts of DC or low frequency current passing therethrough.

3,603,903

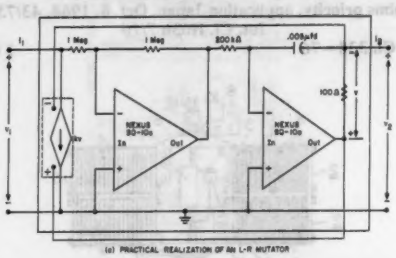
LINEAR ACTIVE NETWORK DEVICE FOR TRANSFORMING ONE CLASS OF NONLINEAR DEVICES INTO ANOTHER

Leon O. Chua, West Lafayette, Ind., assignor to Purdue Research Foundation

Filed May 27, 1968, Ser. No. 732,403
Int. Cl. H03h 7/00, 11/00
U.S. Cl. 333—80 R 14 Claims

A linear active two-port network element for synthesizing nonlinear network components with arbitrarily prescribed

characteristics. The elements, by themselves or in combination, can be utilized for a variety of applications, and are particularly useful in integrated circuit technology. The element included herein is the Mutator. The Mutator essentially



transforms, or mutates one class of nonlinear devices into another; for example, a nonlinear resistor may be changed to a nonlinear inductor, a nonlinear inductor to a nonlinear capacitor, a nonlinear capacitor to a nonlinear resistor, and so on.

3,603,904

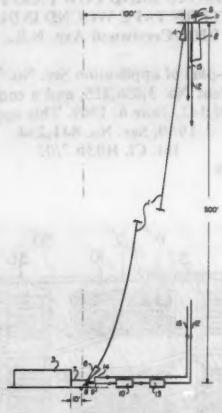
TEMPERATURE CONTROLLED SURFACE WAVE FEEDER LINES

Theodore Hafner, 1501 Broadway, New York, N.Y.

Filed June 4, 1969, Ser. No. 830,932

Int. Cl. H01p *3/08, 1/30;* **H01b** *7/34*

U.S. Cl. 333—95 S **7 Claims**



The invention consists of a surface wave antenna feeder in the form of a conductive tubing coated with a dielectric to produce on the outside of the coated conductor a field carrying substantially the entire electromagnetic wave energy from the transmitter to the antenna, and providing inside the tubing a circulating fluid so controlled as to maintain the line at a constant temperature substantially to exclude longitudinal expansion, regardless of the power level of the surface wave and the temperatures surrounding the line.

3,603,905

SYMMETRICAL FLEXIBLE WAVEGUIDE

Erich Schuttloffel, Backnang, Germany, assignor to Telefunken Patentverwertungsgesellshaft m.b.H., Ulm (Danube) Germany

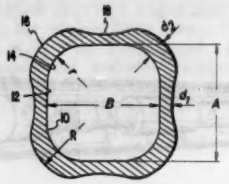
Filed Sept. 9, 1969, Ser. No. 856,271

Claims priority, application Germany, Oct. 5, 1968, P 18 01 536.6

Int. Cl. H01p *3/12,3/14;* **F16l** *9/06*

U.S.Cl. 333—95 A **4 Claims**

A waveguide twistable of the type which can be wound on a drum for simultaneously transmitting two mutually perpendicular linearly polarized electromagnetic waves comprises a metal tube which has a constant cross-sectional profile along its length. The profile is approximately square and has rounded corners and includes thin wall portions which extend along the entire length of the tube. The thin wall portions are appropriately shaped to maintain the profile substantially symmetrical with respect to imaginary mutually perpendicular lines drawn across the said profiles from the center of each square side when the waveguide is bent about a given radius of curvature, or twisted through a given torsional angle.



3,603,906

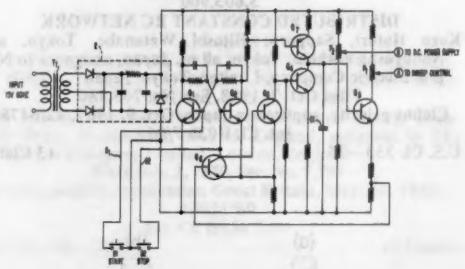
ELECTRONIC SWEEP PROGRAMMER CIRCUIT FOR SUPPLYING COIL CURRENT IN TESTING A PISTON ASSEMBLY

Vernon G. H. Naylor, St. Petersburg, Fla., assignor to Simmonds Precision Products, Inc., Terrytown, N.Y.

Filed Sept. 23, 1969, Ser. No. 860,299

Int. Cl. H03k *3/286, 3/295*

U.S. Cl. 331—111 **3 Claims**



An electronic programmer sweep circuit for testing a piston assembly which utilizes a flip-flop, a storage device and a feedback from the storage device for energizing a trigger circuit forming part of the flip-flop to supply a coil current increasing at a constant rate and similarly decreasing at a constant rate.

3,603,907

SEALED REED RELAY

Josef Staufen Weber, Breisgau, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 5, 1969, Ser. No. 882,624

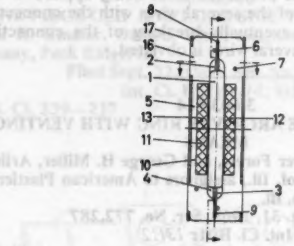
Claims priority, application Germany, Dec. 7, 1968, G 68 10 352

Int. Cl. H01h *50/04, 51/28*

U.S. Cl. 335—151 **4 Claims**

A mounting structure for a reed relay and coil which holds both the coil and the reed envelope individually. The mounting structure has a baseplate of insulting material apertured

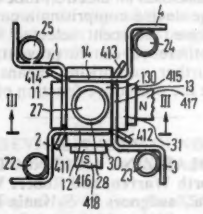
to contact both the envelope and coil. The aperture is less in width in one area than the diameter of the envelope and in another area less in width than the coil diameter to contact both and them preferably against an enclosing member.



3,603,908
PERMANENT MAGNET SYSTEM FOR TRAVELLING WAVE TUBES

Herbert Sarnezki, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jan. 21, 1970, Ser. No. 4,541
Claims priority, application Germany, Jan. 28, 1969, P 19 04 131.7
Int. Cl. H01f *7/00*
U.S. Cl. 335—210 **10 Claims**



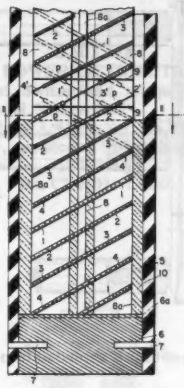
Permanent magnet beam-focusing apparatus comprises a plurality of permanent magnets having pole shoes arranged in a stacked relationship and secured in a plurality of interlocked comblike metal sheets of quadrilateral cross section, the pole shoes resiliently abutting individual fitting edges of the comb teeth to accurately position the magnetic field established by the permanent magnets.

3,603,909
MULTI-FUSE-LINK HIGH-VOLTAGE FUSE HAVING A LINK-SUPPORTING MANDREL AND MEANS FOR EQUALIZING THE INTERRUPTING DUTY OF THE FUSE LINKS

Erwin Salzer, Waban, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed July 6, 1970, Ser. No. 52,218
Int. Cl. H01h *85/04*
U.S. Cl. 337—161 **7 Claims**

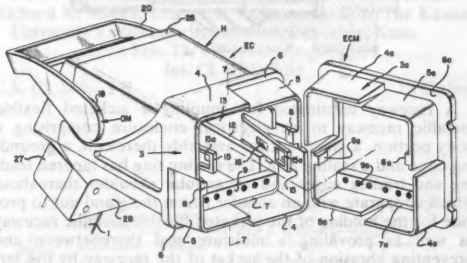
A high-voltage fuse of the kind wherein a plurality of ribbon fuse links are wound around a mandrel structure in helical paths. The fuse further includes a pair of axially spaced auxiliary conductors wound around the mandrel structure adjacent the center region thereof and intersecting each of said plurality of fuse links at a predetermined acute angle. The pair of auxiliary conductors intersect said plurality of fuse links preferably at points where the latter are supported by said mandrel structure, and spot welds located at these points establish connections between said pair of auxiliary conductors and said plurality of fuse links.



3,603,910
ELECTRICAL CONNECTOR MEANS HAVING OPERATING MEANS FOR CONNECTING MULTICONDUCTOR CABLE MEANS

William Ludlow Schumacher, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 14, 1969, Ser. No. 807,198
Int. Cl. H01r *13/54, 13/62*
U.S. Cl. 339—45 **10 Claims**



An electrical connector comprises a housing member housing electrical terminals disposed in dielectric blocks. Latching arms are movably mounted in guide slots along opposing sides of the housing member. Cam means are provided in the slots and on the latching arms to cause latching sections of the latching arms to be moved into and out of latching engagement with a complementary housing member when eccentric operating means operate the latching arms so that the mating electrical terminals are connected and operate the latching arms. Polarizing means are provided on the housing members to assure proper engagement therebetween.

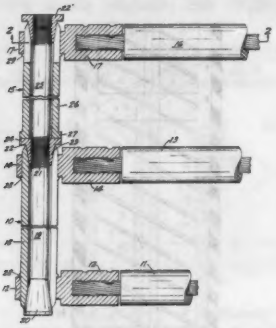
3,603,911
CABLE CONNECTOR

Roy D. Erickson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed Sept. 25, 1969, Ser. No. 860,919
Int. Cl. H01r *7/08*
U.S. Cl. 339—267 **7 Claims**

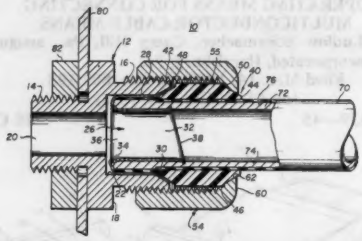
A connector for joining one or more distribution cables to a supply cable. A radially expandable sleeve fitting within

ringlike cable terminal lugs surrounds a threaded rod having a conical head and fitted with an axially extended terminal



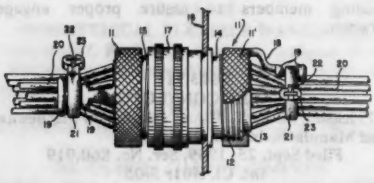
nut. Each subsequent unit is threaded into the preceding terminal nut.

3,603,912
RACEWAY TERMINATOR
William E. Kelly, Bradley Beach, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Aug. 25, 1969, Ser. No. 852,863
Int. Cl. H01r *13/54*
U.S. Cl. 339—89 C **4 Claims**



A raceway terminator for coupling a jacketed flexible metallic raceway to an electrical enclosure comprising a body portion, a gland nut for assembly therewith, a grounding cone and a sealing ring. The sealing ring has tapered leading and trailing edges and an annular shoulder thereabout which cooperate with an annular rib on the gland nut to provide for the holding of the jacketed flexible metallic raceway as well as providing a moisture seal therebetween and preventing abrasion of the jacket of the raceway by the terminator.

3,603,913
STRAIN RELIEF CLAMP FOR ELECTRICAL WIRING CONNECTOR
John M. Hasty, Jr., Smyrna, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Apr. 11, 1969, Ser. No. 815,314
Int. Cl. H01r *13/58*
U.S. Cl. 339—104 **8 Claims**

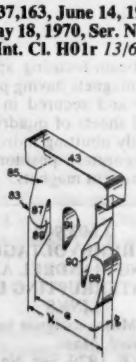


A clamping device is designed for use on general purpose multipin connectors by attaching to the connector and extending therefrom to terminate in a wire-bearing surface with means to facilitate retention of a band or tie string to secure all the wires extending from the connector. This bundle of wires is thereby gripped in a firm and immovable position so that all linear and lateral movement thereof which might occur in operation is prevented from being applied to the point of connection of the several wires with the connector. Thus, stressing and eventually breaking of the connection point of any of the several wires is obviated.

3,603,914
ELECTRON TUBE ARC-OVER RING WITH VENTING MEANS
Fred P. Manetti, River Forest, and George H. Miller, Arlington Heights, both of, Ill., assignors to American Plasticraft Company, Chicago, Ill.
Filed Oct. 31, 1968, Ser. No. 772,287
Int. Cl. H01r *13/12*
U.S. Cl. 339—143 **5 Claims**

This invention discloses an electron tube sockets having an arc-over protective device comprising a conductor ring having prongs positioned adjacent selected lead terminals to form an arc gap therebetween to prevent arching between terminals, and further comprising means for venting the socket to enhance the protective function of the device.

3,603,915
MEANS FOR POLARIZING A CONNECTOR ASSEMBLY
Max L. Jayne, North Warren, and Robert W. Pihlblad, Warren, both of, Pa., assignors to Sylvania Electric Products, Inc.
Division of Ser. No. 737,163, June 14, 1968, Pat. No. 3,566,340
Filed May 18, 1970, Ser. No. 37,960
Int. Cl. H01r *13/64*
U.S. Cl. 339—186 M **3 Claims**



Removable key means for polarizing a multiple-contact connector assembly for accommodating printed circuit boards whereof at least one key of flexural material has arm-like side members discretely formed to resiliently fit within respective spaced-apart polarizing channels in a manner that the key can be easily inserted thereinto and resiliently retained therein to provide desired polarization of the as-

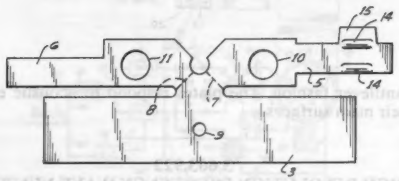
sembly. The key is also formed with provisions to provide facile removal thereof when a change of polarization is desired.

3,603,916

ONE-PIECE CLIP AND LOAD SIDE TERMINAL STRAP

Rolf H. Kindler, Oxford, Ohio, assignor to Square D Company, Park Ridge, Ill.

Filed Sept. 22, 1969, Ser. No. 859,696
Int. Cl. H01r 9/18, 9/12
U.S. Cl. 339—217 6 Claims



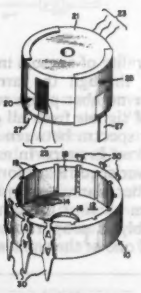
The combined fuse clip and terminal strap is a single piece of metal punched in the flat to provide a body portion with arms extending laterally from opposite sides of one end of the body and terminal straps extending laterally from opposite sides of the opposite end of the body. The arms are bent generally normal to the plane of the body to form clips for resiliently clamping onto a fuse received therebetween. The straps are bent about form lines at 45° to the length of the body and 90° to each other so they both lie in face to face juxtaposition with each other and with one strap juxtaposed firmly and resiliently in face to face contact with the face of the body opposite the clip arms. The other strap is juxtaposed firmly against the under face of the first strap. The one of the straps juxtaposed against the body has bosses protruding in the same direction as the clip arms for centering a conducting wire to be connected to the terminal straps. The body and straps have aligned openings through which extends a screw which is in threaded engagement with the body for clamping the combined clip and terminal strap to a supporting base.

3,603,917

MOUNTING DEVICE FOR A WOUND INDUCTOR

Radford K. Owen, Lynchburg, Va., assignor to General Electric Company

Filed Sept. 2, 1969, Ser. No. 854,623
Int. Cl. H01r 13/50
U.S. Cl. 339—220 C 8 Claims



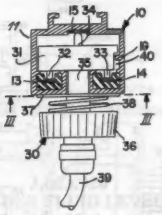
A mounting device for a wound inductor is provided by an insulating cylindrical member that is open at one end and closed at the other end to form a receptacle for the inductor. The cylindrical member has a plurality of equally spaced slots that extend longitudinally along its inner cylindrical surface to locate terminals that extend longitudinally along its outer cylindrical surface. The inductor is fastened in the receptacle and connected to appropriate terminals at the open end. The terminals extend beyond the closed end and can pass through openings in a printed circuit board for soldering.

3,603,918

ELECTRIC POWER DISTRIBUTION SYSTEM

Hans Woertz, Basel, Switzerland, assignor to Oskar Woertz, Inh., H. & O., Basel, Switzerland

Filed June 3, 1969, Ser. No. 829,981
Claims priority, application Switzerland, Dec. 6, 1969, 18225/68
Int. Cl. H01r 13/60
U.S. Cl. 339—22 T 14 Claims



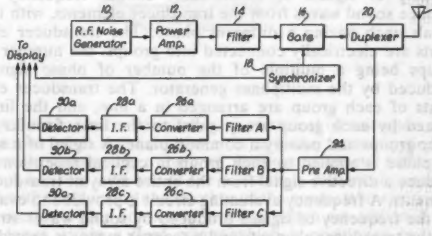
Electric power distribution system having at least one current-carrying bar with a continuous elongated slot and corresponding contact parts on current collectors to cooperate with the current-carrying bar.

3,603,919

POLY-PANCHROMATIC TARGET IDENTIFICATION

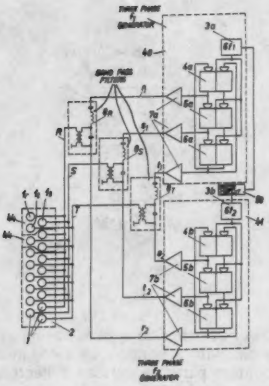
Richard K. Moore, Lawrence, Kans., assignor to The Kansas University Endowment Association, Lawrence, Kans.

Filed Feb. 27, 1969, Ser. No. 802,851
Int. Cl. G01s 9/66
U.S. Cl. 340—1 R 10 Claims



In a radar or sonar system, a continuous spectrum of electromagnetic or compressional wave energy is transmitted and defines a wide band of frequencies. The receiver has one or more channels, the multiple channel arrangement defining subbands of the transmitted frequency band which are separately detected so that an identification signal is derived from each channel respectively. Each identification signal represents the response of the target to that particular frequency subband, such signals being combined as desired to provide a suitable readout. For three information signal output logic, a color cathode-ray tube provides an effective display by controlling each color input thereof in accordance with a corresponding one of the identification signals.

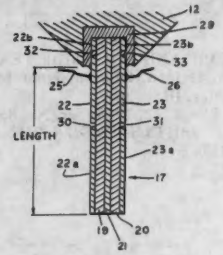
3,603,920
VELOCITY MEASURING DEVICE
Wolfgang Richard Ernst Stedtnitz, Bremen, Germany, assignor to Fried Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Aug. 14, 1969, Ser. No. 850,146
Claims priority, application Germany, Sept. 19, 1968, P 17 98 276.2
Int. Cl. G01s 9/66
U.S. Cl. 340—3 D 12 Claims



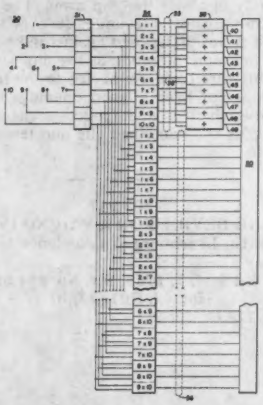
Apparatus for determining the velocity and direction of movement of a vehicle by measuring the Doppler effect, which apparatus includes an array of individual transducer elements mounted on the bottom of the vehicle, each element including means for sending and receiving sound signals and being equidistantly spaced from adjacent elements. Multiphase signal-generating means are provided to generate a plurality of signals of substantially similar frequency to produce sound waves from the transducer elements, with the signals each having a different phase. The transducer elements are electrically connected into groups, the number of groups being a multiple of the number of phase signals produced by the multiphase generator. The transducer elements of each group are arranged in a line, and the lines formed by each group are parallel to the lines formed by other groups and occupy a common plane. A signal of a single phase is applied to each group in cyclical repetition to produce a directive signal from the entire array of transducer elements. A frequency evaluating circuit is provided to evaluate the frequency of signals produced by sound waves striking the transducer elements and a scanner means is provided to successively connect each group of transducer elements to the frequency-evaluating circuit in a cycle having substantially the same period as the cyclical repetition of the sound radiating signal.

3,603,921
SOUND TRANSDUCER
Robert H. Dreisbach, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.
Continuation of application Ser. No. 596,007, Nov. 21, 1966, now abandoned. This application Dec. 18, 1968, Ser. No. 787,301
Int. Cl. H04r 17/00
U.S. Cl. 340—10 18 Claims

A sound transducer has an inertial mass and one or more acoustic transducer plates fastened along an edge to the mass in cantilever fashion. The plates respond to acoustic energy at their main surfaces.



3,603,922
HIGH RESOLUTION FREQUENCY WAVE NUMBER SPECTRA FOR DETECTION AND LOCATION OF WEAK SIGNALS
George D. Hair, Jr., Irving, and William P. Haney, Garland, both of, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of application Ser. No. 618,299, Feb. 20, 1967, now abandoned. This application Sept. 22, 1969, Ser. No. 860,120
Int. Cl. G01v 1/00
U.S. Cl. 340—15.5RSC 14 Claims

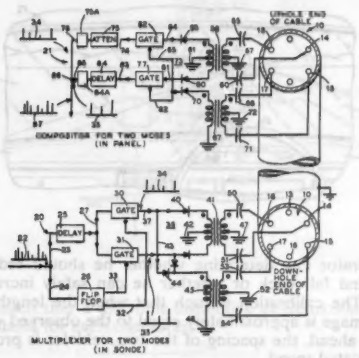


Signals from a plurality of sensors in an array which monitors energy passing through the array are processed for production of a wave-number-plane response employing the autopower spectra of signals from all of the sensor locations and the cross-power spectra between signals from all of the sensing locations, taken in pairs. In accordance with the invention, the autopower spectra are formed for use in production of a wave-number-plane response by summing the autopower spectra from each of the other sensors with a constant which preferably is proportionally related to the autopower spectrum of one of the signals.

3,603,923
SIGNALING SYSTEM
William B. Nelligan, Danbury, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Sept. 10, 1968, Ser. No. 758,717
Int. Cl. H04j 3/02
U.S. Cl. 340—18 9 Claims

In one illustrative embodiment of the invention, an armored multiconductor cable connects an array of transfor-

mers and gate circuits in a borehole logging tool with a similar array at the earth's surface. The downhole gates are enabled in a predetermined order to transmit sequential portions of a logging signal to the surface. A downhole logic circuit applies the successive signal portions to the cable conductors in a series of conductors potential combinations, or modes. The mode signals enable respective gates at the earth's surface to produce a sequence of pulses that corresponds to the original signal.

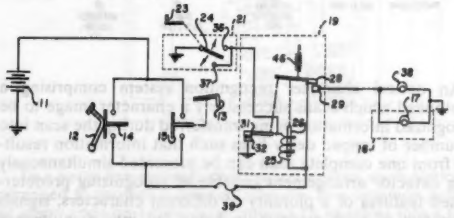


3,603,924

STOP-WARNING DEVICE FOR VEHICLES

Forest K. Harbert, 10 Highland Avenue, Torrens Park, Australia 5062

Filed May 8, 1969, Ser. No. 823,031
Int. Cl. B60q *1/44*
U.S. Cl. 340—52 **9 Claims**



A safety device for vehicles employs a positive warning member visibly displaying the work "Stop" to enable the driver of a vehicle to warn others that the driver intends to stop or is already stopped. A control for the warning member functions independently of existing brake lights but in conjunction with the existing equipment of the vehicle such as the foot brake pedal or hand brake lever and is operational to be turned on by a second actuator only when one of the brakes are first actuated and stays on until the brakes are released.

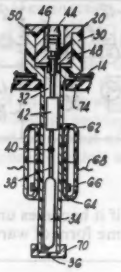
3,603,925

MASTER CYLINDER RESERVOIR LEVEL INDICATOR

Harold W. Hughes, and Samuel E. Stone, both of St. Joseph, Mich., assignors to The Bendix Corporation

Filed Oct. 21, 1968, Ser. No. 769,327
Int. Cl. B60t *17/22*; G01f *23/12*
U.S. Cl. 340—59 **2 Claims**

A reed switch assembly that is integrated with a lid for a fluid reservoir and has a float within which a magnet is affixed to operate the reed switch and close an electrical circuit upon the approach of a predetermined low level of the fluid in the reservoir.

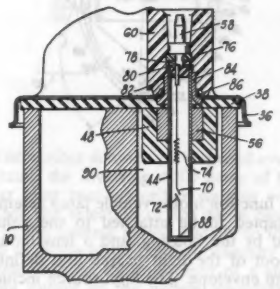


3,603,926

MASTER CYLINDER FLUID LEVEL INDICATOR

Jack A. Kimura, St. Joseph, Mich., assignor to The Bendix Corporation

Filed June 20, 1968, Ser. No. 738,644
Int. Cl. B60t *17/22*
U.S. Cl. 340—59 **1 Claim**



A fluid indicator for closing an electrical circuit upon the approach of a low liquid level in a brake master cylinder reservoir employing a pair of resilient contacts within a switch housing with one of the contacts in electrical connection with the housing and another of the contacts in electrical connection with a connector terminal which are activated by a magnet within a float means which is positioned by the liquid level in the reservoir and including provisions to eliminate the effect of liquid motion in the reservoir on the operation of the switch.

3,603,927

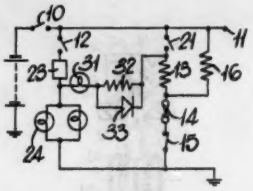
FLUID LEVEL INDICATORS

Arthur P. Osborne, Wellington, England, assignor to Girling Limited, Birmingham, England

Filed Mar. 27, 1969, Ser. No. 811,063
Claims priority, application Great Britain, Apr. 2, 1968, 15756/68
Int. Cl. B60q *1/00*
U.S. Cl. 340—59 **13 Claims**

In a fluid level indicator, particularly for a vehicle hydraulic braking system, a fusible link is mounted in the container

within which the level of liquid is to be monitored. This link is connected in a circuit such that the link will not fuse provided it is covered, but if it becomes uncovered at any time it will fuse and operate some form of warning device.

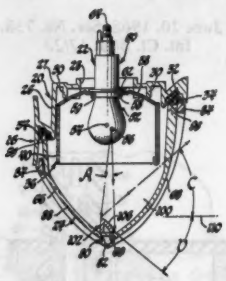


3,603,928

PARKING, TURN SIGNAL, AND SIDE MARKER LAMP ASSEMBLY

Guido C. Speedy, Anderson, Ind., and William T. Collins, Jr., Birmingham, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 25, 1969, Ser. No. 852,692
Int. Cl. B60q 1/32; G02l 17/00
U.S. Cl. 340—87 **3 Claims**



A multiple function motor vehicle lamp assembly includes a housing adapted to be attached to the vehicle, a light source carried by the housing, and a lens mounted on the housing in front of the light source and defining with the housing a lamp envelope. The light source includes two filaments, one of which is intermittently energized for providing a turn signal function and the other of which is steadily energized for providing a clearance or parking lamp function. An elongated mirror having a vertically disposed cylindrical reflecting surface is fixedly secured to an interior surface of the lens and intercepts and redirects a predetermined portion of the illumination projected by the steadily energized filament for providing a side marker lamp function.

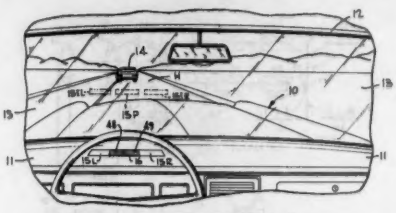
3,603,929

DISTANCE MEASURING DEVICE

Thomas T. Drysdale, 4116 Witacre Road, Fairfax, Va.

Filed Sept. 17, 1969, Ser. No. 858,774
Int. Cl. B60r 1/00; G01c 3/00
U.S. Cl. 340—104 **8 Claims**

The gauging means is installed in a recess in the top of the dash of an automobile and consists of horizontally relatively movable strips geared to a speedometer means to assume positions the spacing of which bears a relationship to the speed of the car. A phantom image of the two gauge strips is projected upon and reflected from the glass windshield in a position approximately at eye-level and in the line of vision toward a car ahead. The eyes of the observer-driver are naturally focused on the car ahead and thus a double image of the gauge strips is seen and due to the overlap of vision, a centrally disposed composite phantom strip of a length variable according to the speed of the car appears in substantial registry with the view of the car ahead. By proper calibration of the gauge, it will be seen that when the apparent lateral dimension of the car ahead exceeds or falls short of the length of the phantom overlapping image of the gauge strips,



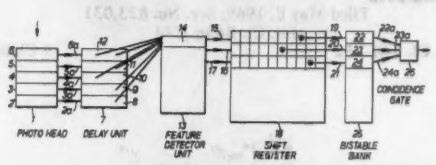
the operator can determine whether he should reduce his speed and fall back or whether he can safely increase his speed. The calibration is such that when the length of the gauge image is approximately equal to the observed width of the car ahead, the spacing of the two vehicles is proper for the indicated speed.

3,603,930

OPTICAL CHARACTER RECOGNITION SYSTEM INCLUDING SCANNED DIODE MATRIX

Ronald H. Britt, Ilford, Essex, England, assignor to The Plessey Company Limited, Ilford, Essex, England

Filed July 14, 1969, Ser. No. 841,506
Claims priority, application Great Britain, July 18, 1968, 34245/68
Int. Cl. G06k 9/06
U.S. Cl. 340—146.3 J **3 Claims**



An optical character recognition system comprising a photohead which scans successively a character image to be recognized information being transferred during the scan into a number of tapped delay lines such that information resulting from one complete scan can be presented simultaneously to a detector arrangement capable of recognizing predetermined features of a plurality of different characters, signals indicative of such recognition being fed into a multistage shift register the contents of which are sampled by character detector means which provides a final output signal when predetermined signal state is obtained in selected stages of the shift register.

3,603,931

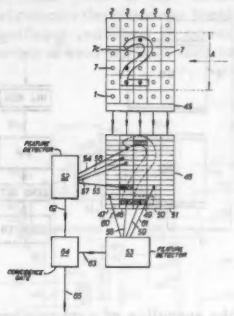
OPTICAL CHARACTER RECOGNITION SYSTEM INCLUDING A MATRIX OF SCANNED PHOTOSENSITIVE ELEMENTS

Ronald H. Britt, and Peter C. Matthews, both of Ilford, England, assignors to The Plessey Company Limited, Ilford, England

Filed July 16, 1969, Ser. No. 842,200
Claims priority, application Great Britain, July 18, 1968, July 18, 1968, July 18, 1968, 34242/68;34244/68;34245/68
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 J **3 Claims**

A method of optical character recognition comprising utilizing a photohead having a matrix of photosensitive elements which are scanned successively and sampling the signals obtained during each scan for the purpose of detectingthe presence of signals appertaining to a characteristic

feature of one or more characters. The same feature may occur in several different characters but the features are chosen such that a different distinctive combination of features obtains for each character.

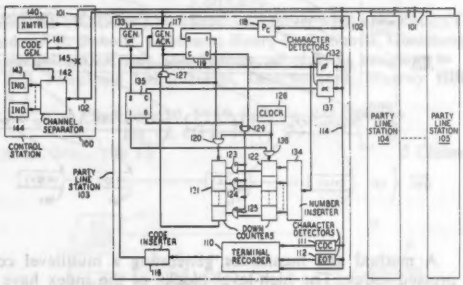


3,603,932

PARTY LINE STATIONS FOR SELECTIVE CALLING SYSTEMS

Douglas A. Kerr, Albuquerque, N. Mex., and Bernard B. Kolodner, Philadelphia, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 7, 1969, Ser. No. 814,058
Int. Cl. H04l 7/00; H04j 3/06
U.S. Cl. 340—147 **3 Claims**



In a party line message distribution system, each station is arranged to provide a delayed response to a common polling or query code on a time division basis by inserting into a time slot individual thereto a response code indicating whether the station is prepared to receive a message. Each station includes an arrangement for modifying the delay to compensate for the delay of the transmission medium. When a station is designated to determine the delay modification, the station sends a test signal which is recirculated back to the station via the control station. The delay of the response is then reduced in accordance with the recirculating time.

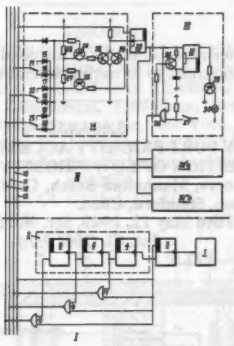
3,603,933

APPARATUS FOR THE TRANSMISSION OF INFORMATION

Siegfried Bidermann, Schellenberg, Liechtenstein, assignor to Unionorm Anstalt, Vaduz, Liechtenstein

Filed Apr. 6, 1970, Ser. No. 25,674
Int. Cl. H04g 5/00
U.S. Cl. 340—172.5 **6 Claims**

An apparatus for transmission of informations between a plurality of subscriber stations over a common transmission path for light call devices, light call speaking devices, observation devices, remote power devices, persons investigation devices, remote indicators, remote control means and the like, which comprises means for operating receivers of the subscriber stations upon occurrence thereon of a predetermined binary code delivered by an impulse generator over a counter chain including flip-flops. At least to two subscriber stations each are coordinated a predetermined time section divided into at least two part-time periods, in the manner of a time multiplex system. A connection between the subscriber stations is performed by the binary code during the subscriber time period within one time period of the part-time periods and transmits within the other of the part-time periods informations between the subscriber stations, whereby the outputs of the individual steps of the counter chain are fed to signal conduits serving the address and information transmission and an output of a flip-flop delivering a phase frequency to a phase conduit serving the phase transmission. All subscriber stations are disposed over an address-decoding circuit, the inverting AND gates of the latter and diodes for at least two subscriber stations coordinated to each other for the selection of the same binary code are transmitted in the address period equally to the signal conduits, as well as to the phase conduit, whereby for the transmission of informations the one input of a storage is connected to the output of the address-decoding circuit, the other input of the storage is disposed by means of intermediate members on the phase conduit, and the output of which leads to an input of a receiving storage controlling the receiving device, the other output of which is connected with one of the signal conduits, and for emitting the informations the output of the address coding circuit is in connection by means of a switching device likewise with one of the signal conduits.



3,603,934

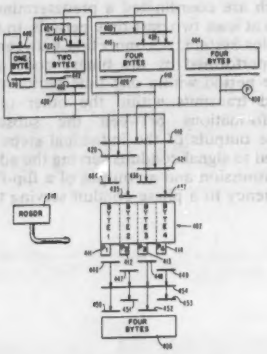
DATA PROCESSING SYSTEM CAPABLE OF OPERATION DESPITE A MALFUNCTION

Harold F. Heath, Jr., Poughkeepsie, and Samir S. Husson, White Plains, both of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 15, 1968, Ser. No. 744,950
Int. Cl. G06f 7/00, 11/00
U.S. Cl. 340—172.5 **13 Claims**

An electronic data processing machine wherein various functional units such as the adder and certain registers may be utilized at one-half or a lesser fraction of their normal operating capability. Upon detection of an error in one of said functional units, the system will determine whether one-half of the unit is functioning properly. Data will be sent through the properly functioning half of the unit in two or

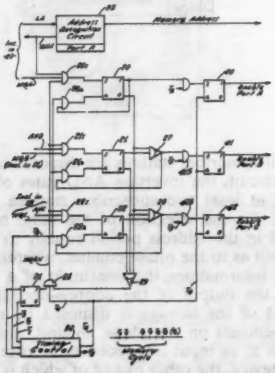
more passes to perform the same operation that would have been performed in one pass if there had been no malfunction. Upon termination of the error condition the unit is automatically returned to its normal operating mode.



3,603,935
MEMORY PORT PRIORITY ACCESS SYSTEM WITH INHIBITION OF LOW PRIORITY LOCK-OUT

Ralph C. Moore, Manhattan Beach, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 12, 1969, Ser. No. 823,896
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 2 Claims



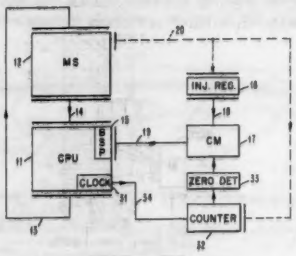
A control system for handling overlapping requests for communication between a plurality of processors and a memory or a memory bank is disclosed causing requests, after acceptance, to be serviced on a predetermined priority basis but preventing acceptance of new requests until all requests pending at the respective previous acceptance phase have been honored.

3,603,936
MICROPROGRAMMED DATA PROCESSINGSYSTEM

DennisP. Attwood, Winchester; David M. Syme, Otterbourne, and Harold W. Tuffill, Brambridge, Eastleigh, all of, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1969, Ser. No. 883,055
Int. Cl. G06f 11/04
U.S. Cl. 340—172.5 20 Claims

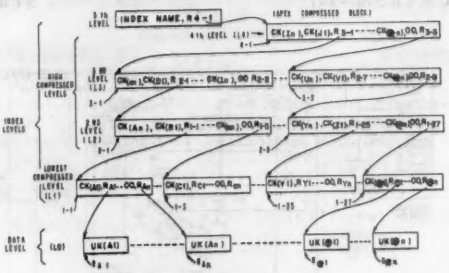
Apparatus for injecting simulated monitoring or control data into a microprogrammed data processing system for diagnostic purposes to initiate a particular system test or response. The data injection takes place at a preselected stage during the execution of a microprogram which stage is identified from microprogram addressing or clocking information.



3,603,937
MULTILEVEL COMPRESSED INDEX GENERATION METHOD AND MEANS

Edward Loizides, Poughkeepsie, and George F. Steigerwalt, Hyde Park, both of, N.N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 26, 1969, Ser. No. 836,930
Int. Cl. G06f 7/22
U.S. Cl. 340—172.5 42 Claims



A method and means for generating a multilevel compressed index. The high-level blocks of the index have an entry format of CK_1, CK_2, R in which R is a pointer to a next lower level compressed index block, and CK_1, and CK_2 are each compressed keys generated from uncompressed keys (UK's) represented by pointers on opposite sides of theend boundariesof select low-level compressed index blocks. The generated multilevel index can be searched using the invention described in U.S. application No. 836,825.

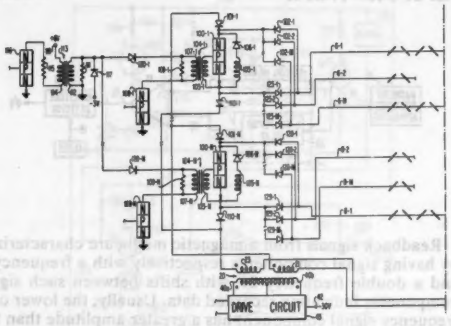
3,603,938
DRIVE SYSTEM FOR A MEMORY ARRAY

Thomas S. Cooper, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,451
Int. Cl. G11c 7/00, 5/02
U.S. Cl. 340—174 M 2 Claims

A drive system for a magnetic core array is disclosed which employs transistor switches for selectively applying the energizing currents to the drive lines. The transistor switches are in the form of floating, nonsaturating switches of the type disclosed in U.S. Pat. No. 3,289,008. The secondary windings of power supply transformers provide the sole source of energizing current for the drive lines. This isolates the drive lines from the direct current power supplies thereby minimizing the coupling of currents from the drive lines to the sense lines. The selected transistor switches are turned on to complete series circuits through their respective drive lines prior to application of a square wave voltage pulse applied to

the drive lines by the pulse or power transformers. The voltage pulse provided by the power supply transformer is removed a short time prior to the turning off of the transistors. This eliminates the transistor breakdown problem and affords a significant reduction in power consumption. Each transistor switch is used for both read and write operations. This is accomplished by providing isolation diodes which are back biased by the power supply transformers to isolate the commoned collectors and emitters of the switching transistors and thereby prevent current flow in an undesired path. There is thus afforded a substantial reduction in the number of transistors and coupling transformers required in the drive system.

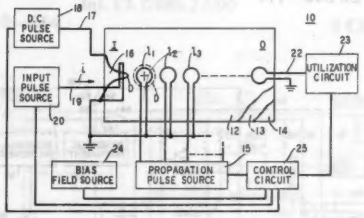


3,603,939

MAGNETIC DOMAIN PROPAGATION ARRANGEMENT

Andrew H. Bobeck, Chatham; Henry E. D. Scovil, Gladstone, and AlfredA.Thiele,East Orange, all of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 30, 1969, Ser. No. 846,208
Int. Cl. G11c *11/14, 19/00*
U.S. Cl. 340—174 TF **5 Claims**



Optimum size of single wall domains in a magnetic sheet is reduced by applying to each face of the sheet a high permeability overlay of prescribed thickness. Increased packing densities and operating margins result.

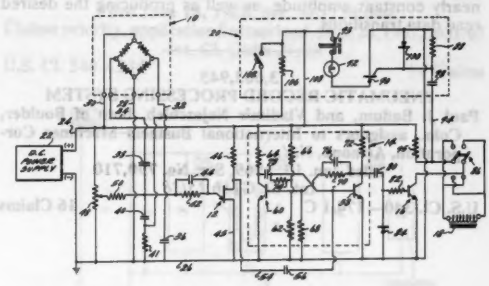
3,603,940

PULSE STORAGE AND COUNT-OUT DEVICE

Max M. Adams, Cincinnati, Ohio, assignor to General Electric Company

Filed Aug. 28, 1969, Ser. No. 853,643
Int. Cl. G11c *11/06, 7/00*
U.S. Cl. 340—174 QP **10 Claims**

Apparatus for storing and/or counting out a series of magnetic pulses. Circuitry is shown for generating a rectangular pulse to correspond to the sensing of an event. This rectangular pulse applies a predetermined number of volt-seconds to a winding associated with a single magnetic storage core. A count-out circuit includes both means for determining the number of pulses stored and means for determining when the core is saturated. Provision is made to utilize the same circuitry to count-in as to count-out.

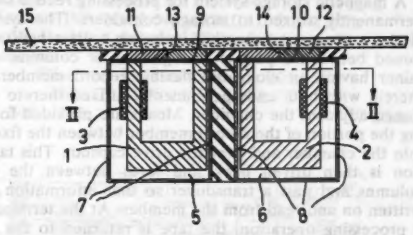


3,603,941

COMBINATION OF TWO OR MORE SHIELDED MAGNETIC HEADS HAVING AT LEAST ONE WRITING HEAD AND AT LEAST ONE READING HEAD

Jacob Koorneef, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 16, 1968, Ser. No. 753,125
Claims priority, application Netherlands, Aug. 31, 1967, 6712006
Int. Cl. G11b *5/10, 5/28*
U.S. Cl. 340—174.1 F **4 Claims**



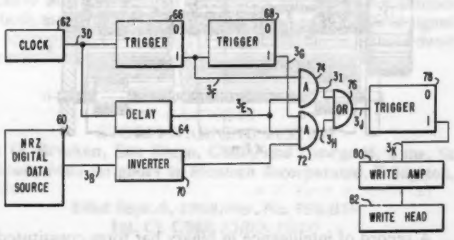
A shielded multiple magnetic head wherein the heads are electrically screened from each other by a box-shaped enclosure of electrically conductive material. The bottom of the enclosure surrounds the lower portion of the head. The top of the enclosure interrupts the head between the upper and lower portions thereof.

3,603,942

PREDIFFERENTIATED RECORDING

Robert F. Heidecker, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

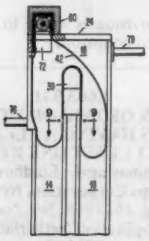
Filed Jan. 13, 1969, Ser. No. 790,647
Int. Cl. G11b *5/04*
U.S. Cl. 340—174.1 G **9 Claims**



System and method for magnetic recording to produce a read voltage having transitions such as zero crossings

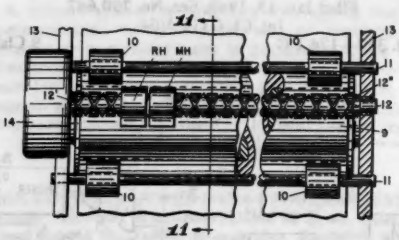
representing the recorded data. No differentiation of the read voltage is necessary. High frequency switching of the write current is used at times to maintain the read voltage at a nearly constant amplitude, as well as producing the desired read data transitions.

3,603,943
PNEUMATIC RECORD PROCESSING SYSTEM
Paul J. Badum, and Vladimir Nejezchleb, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 13, 1969, Ser. No. 790,710
Int. Cl. G11b *15/38*
U.S. Cl. 340—174.1 C **16 Claims**



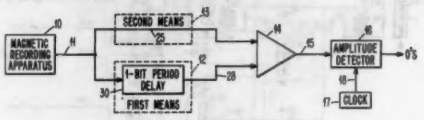
A magnetic storage system for processing record members permanently affixed to storage containers. The system includes a processing chamber including a drive capstan positioned between a pair of storage bins or columns. A container having an elongated flexible record member stored therein with both ends permanently affixed thereto is positioned adjacent the chamber. Means are provided for drawing the portion of the record member between the fixed ends into the chamber and over the drive capstan. This tape portion is then driven back and forth between the storage columns and past a transducer so that information can be written on and read from the member. At the termination of a processing operation, the tape is returned to the storage container and the container is removed.

3,603,944
SYSTEM FOR PROCESSING INTELLIGENCE IN FORM OF BINARY BARS
John F. Taplin, 15 Sewall St., West Newton, Mass.
Filed Apr. 15, 1969, Ser. No. 816,227
Int. Cl. G11b *5/02*
U.S. Cl. 340—174.1 H **2 Claims**



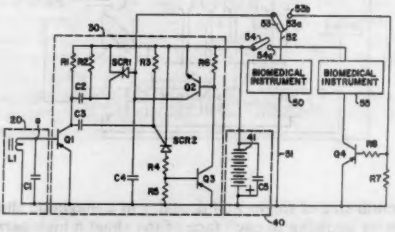
A record of intelligence in binary bar form constituted by deposits of magnetizable ink on a substratum is converted by magnetic carrier-frequency-modulation into a binary carrier-frequency-modulated magnetic patter.

3,603,945
SIGNAL RECOVERY SYSTEM UTILIZING AMPLITUDE COMPARISON AT THE BEGINNING AND END OF A BIT PERIOD
Friedrich R. Hertrich, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 21, 1969, Ser. No. 817,829
Int. Cl. G11b *5/04*
U.S. Cl. 340—174.1 H **9 Claims**



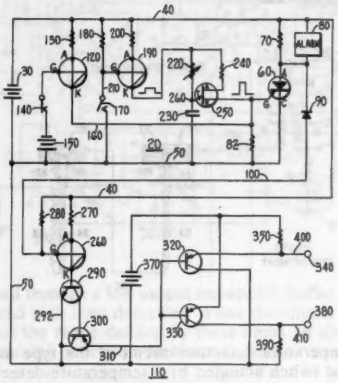
Readback signals from a magnetic media are characterized by having signal components respectively with a frequency F and a double frequency 2F with shifts between such signal components indicating recorded data. Usually, the lower or F frequency signal component has a greater amplitude than the 2F frequency signal. In the recording of binary digital data, a bit period of recording is defined as equal to the wavelength of the 2F signal component. Higher frequency harmonics may be used as the high frequency component wherein the bit period is an integral number of wavelengths of such higher frequency signal component. For data signal recovery, the signal amplitude at the beginning of a given bit period is compared with the signal amplitude at the end of such bit period. If the amplitude comparison shows a substantial difference in amplitude, then the first signal component is indicated; whereas, if the amplitudes are substantially similar, the second or higher frequency signal component is indicated.

3,603,946
TELEMETRY-ACTUATED SWITCH
Robert D. Lee, San Mateo, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Dec. 23, 1969, Ser. No. 887,698
Int. Cl. G08c *15/00*
U.S. Cl. 340—177 **12 Claims**



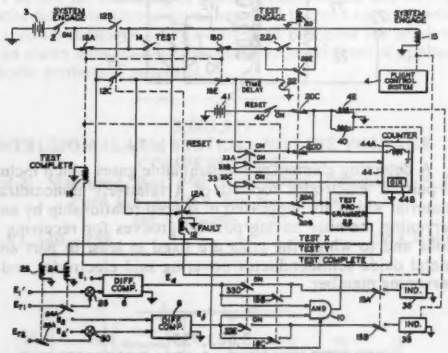
A silicon-controlled rectifier (SCR) provides either a high-impedance or a low-impedance electrical path between, for example, a power source and an instrument. While being switched from its high-impedance to its low-impedance state in response to a first control signal, this SCR is momentarily short-circuited by a transistor which is responsive to both the first control signal and a second control signal. During the momentary short-circuiting, an initial surge of current through a capacitor supplies enough current to the SCR to hold this SCR in its low impedance state. Decay of this current surge with the charging of the capacitor allows this SCR to be switched from its low-impedance to its high-impedance state by again momentarily short-circuiting its anode-to-cathode circuit in response to the second control signal.

3,603,947
MODULAR ALARM SIGNALING SYSTEM
Howard C. Schubert, Leonia, N.J., assignor to Aerolite Electronics Corporation, Union City, N.J.
Filed Oct. 24, 1968, Ser. No. 770,157
Int. Cl. G08b 19/00
U.S. Cl. 340—213 R 8 Claims



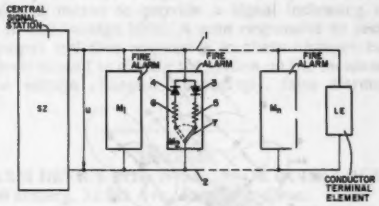
A system including a module for providing an audible or visual and electrical signal in response to a changed condition. The electrical signal is fed to a second module which provides a reversed polarity output onreceiptof the signal. The reversed polarity output is coupled to a third remote module which provides a plurality of indications including an indication of normal conditions and alarm conditions. A fourth module provides power for the system and an auxiliary alarm indication.

3,603,948
FAULT IDENTIFICATION, ISOLATION AND DISPLAY FOR USE WITH AN AIRCRAFT CONTROL SYSTEM
William W. Medlinski, Clifton, N.J., assignor to The Bendix Corporation
Filed Nov. 22, 1968, Ser. No. 778,271
Int. Cl. G08b 23/00
U.S. Cl. 340—214 8 Claims



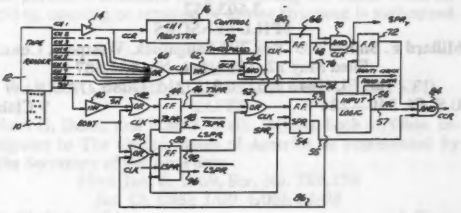
A fault identification, isolation and display device for testing an aircraft control system. The device senses malfunctions in selected portions of the system and provides a visual display which instantaneously identifies and isolates the malfunctioning section and memorizes the fault status of the section until the device is manually or automatically reset.

3,603,949
FIRE ALARM INSTALLATION
Beat Walthard, Stafa, Switzerland, assignor to Cerberus AG, Mannedorf, Switzerland
Filed June 18, 1968, Ser. No. 738,046
Claims priority, application Switzerland, June 26, 1967, 9031/67
Int. Cl. G08b 29/00
U.S. Cl. 340—214 14 Claims



A fire alarm installation is disclosed which provides positive detection of the response or nonresponse of an individual fire alarm during the normal operational condition thereof as well as during a checking operation. Each of the individual fire alarms are provided with circuits which exhibit a high impedance for supply voltages of a first polarity and a low impedance for supply voltages of a second polarity during normal operational conditions. During alarm conditions, however, the impedance-polarity relationships reverse and such is detected at a remote central station.

3,603,950
REDUNDANT SPROCKET LOGIC SYSTEM FOR MACHINE TOOL NUMERICAL CONTROL
Thomas W. Hartford, Livonia, Mich., assignor to The Bendix Corporation
Filed May 21, 1969, Ser. No. 826,557
Int. Cl. G05b 23/00; G06k 7/00
U.S. Cl. 340—222 17 Claims

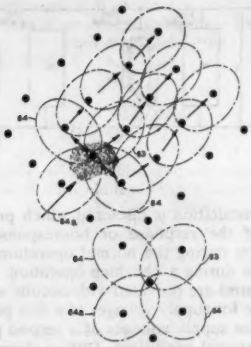


A redundant sprocket logic and malfunction detection system for a machine tool numerical control comprising logic circuits generating a redundant sprocket signal from the instruction bits recorded on each row of coded instruction on a tape. The redundant sprocket signal permits the machine tool control to operate in a normal manner in the absence of reading of the physical sprocket signal corresponding to each row of instruction bits, while providing an alarm signal indicative of malfunction of the system. In the event of absence of both the redundant sprocket signal and the physical signal, an appropriate control signal is generated which shuts down the machine control system.

3,603,951
STORM WARNING SYSTEM
Pat O. Bracken, San Diego, Calif., and George H. Lane, St. Louis, Mo., assignors to Montech Incorporated, Bridgeton, Mo.
Filed Sept. 3, 1968, Ser. No. 756,819
Int. Cl. G08b 25/00, 19/00
U.S. Cl. 340—224 9 Claims

A public warning system for alerting the public of natural disasters, such as tornadoes and other severe atmospheric

disturbances, and having capabilities of giving general warning for civil defense for other emergencies. The system also has the capability to act as a sensor grid to obtain scientific atmospheric or weather or other geophysical data. A unique grid detection system is provided that predetermines and selects the area that will be affected and which residential areas will lie in the path of an approaching tornado. A selective warning of the affected residents is provided by sensor transmitters located in the grid at spaced grid points along the prevailing tornado's track and to some safe distance along each side of the trace by signaling individual receiver alarm devices. The automatic alarm network is self-sustaining and is not dependent upon existing power distribution systems for its actuation.



3,603,952

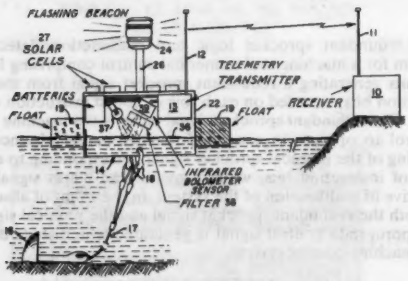
SPILL SENSORS

Millard F. Smith, P.O. Box 295 Saugatuck, Westport, Conn.

Filed May 12, 1969, Ser. No. 823,587

Int. Cl. H04b *1/02*; **G01l** *1/16*; **G08b** *21/00*

U.S. Cl. 340—224 **9 Claims**



Sensing methods and apparatus for monitoring the surface condition of a body of water including floating sensor units deployed on the water surface employing reflected infrared radiation detectors to sense the presence of floating hydrocarbons from an oil spill or floating industrial waste, sewage or the like. Telemetry signals report the surface condition of the body of water to a central receiver unit.

3,603,953

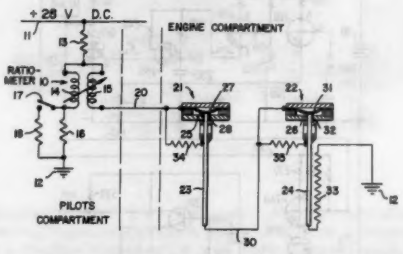
FIRE DETECTOR CIRCUIT

John E. Lindberg, 1211 Upper Happy Valley Road, Lafayette, Calif.; Darrel V. McCoy, Oakland, Calif.; Gordon J. Schanck, Northridge, Calif., and Harry E. Van Cleef, Jr., San Francisco, Calif.

Filed Aug. 18, 1967, Ser. No. 661,559

Int. Cl. G08b *5/36*, *17/06*

U.S. Cl. 340—228 **20 Claims**



A temperature detection circuit of the type including an electrical switch actuated by a temperature-detecting sensor at a predetermined critical temperature, and an electrical indicator in series with the switch, for indication of the actuation of said switch. The circuit is characterized by resistance means which is effectually placed in said circuit in series with the indicator only when the switch is actuated, the indicator including means for giving a different indication for each of the following conditions: (1) when the resistance means is effectually in the circuit, (2) when the circuit from the indicator to the switch is open, and (3) when the circuit from the indicator to the switch is shorted.

3,603,954

GAS ALARM DEVICE

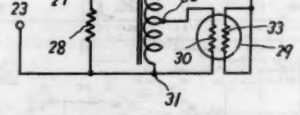
Tutaharu Takeuchi, Osaka-fu, Japan, assignor to New Cosmos Electric Company Limited, Osaka-shi, Japan

Filed Feb. 12, 1970, Ser. No. 10,848

Claims priority, application Japan, Feb. 22, 1969, 44/15836

Int. Cl. G08b *21/00*; **H01c** *13/00*

U.S. Cl. 340—237 R **7 Claims**



A detecting element for inflammable gases which includes a pair of electrodes formed of a relatively nonoxidizable material which are supported in spaced relationship by an intervening member having parallel grooves for receiving the coils and to which the coils are fixed at least in part and a metal oxide semiconductor covering said electrodes and intervening member.

3,603,955

MINUTE VOLUME ALARM EQUIPMENT

Donald Levy, Spring Valley, and Tibor Rusz, Kingston, both of, N.Y., assignors to Donti Research Development Manufacturing, Monsey, N.Y.

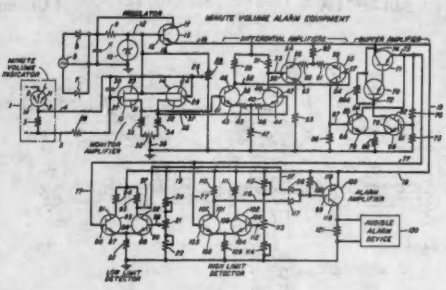
Filed Mar. 5, 1969, Ser. No. 804,389

Int. Cl. G08b *21/00*

U.S. Cl. 340—239 R **2 Claims**

Minute volume alarm equipment for monitoring the flow of gas and producing an alarm when the gas volume falls

without a prescribed range is disclosed. The equipment includes a high input impedance monitor amplifier which senses analog electrical signals in a minute volume indicator. These signals are amplified by a differential amplifier and



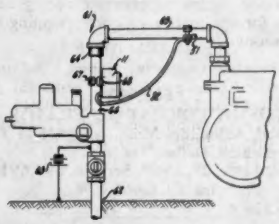
then coupled through a low output impedance buffer amplifier to low and high limit detectors. When the minute volume falls without the range defined by these limits an alarm amplifier is operated to activate an alarm device.

3,603,956

CATHODIC PROTECTION MONITOR

Darrel D. Byerley, Baldwin Park, and Robert B. Fisher, El Monte, both of, Calif., assignors to Tinker and Rasor, San Gabriel, Calif.

Filed June 27, 1969, Ser. No. 837,200
Int. Cl. G08b *21/00*
U.S. Cl. 340—249 **6 Claims**



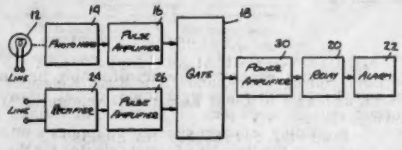
A device for attaching to piping systems or the like having a cathodic protection potential applied thereto and comprising a visual indicator operated by such potential for producing an alarm indication at an adjustable lower level of applied cathodic protection potential.

3,603,957

INTRUSION ALARM SYSTEM AND LINE VOLTAGE COMPENSATION

Floyd S. Merchant, Box #99 Main Street, Pattenberg, N.J.

Filed Jan. 2, 1969, Ser. No. 788,408
Int. Cl. G08b *13/18*
U.S. Cl. 340—258 **26 Claims**



An intrusion alarm system responsive to the amount and rate of decrease of light striking a photohead is provided together with a means to compensate for those line voltage fluctuations which would produce a rapid decrease in light that might trigger a false alarm. The intrusion alarm system employs a pulse amplifier to respond to sudden decreases in light input to a photohead so as to provide a signal which will initiate the alarm.

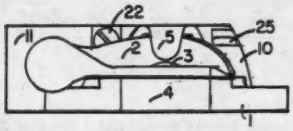
A rectifier coupled to the same line source as is connected to the source of light provides a rectified output having substantial ripple content. A diode bridge sensor compares the rectifier output with a voltage level on a capacitor, thereby establishing a means to provide a signal indicating sharp changes in line voltage level. A gate responsive to rectifier bridge output and thus responsive to sharp changes in line voltage level is used to disable the system on the incidence of such line voltage changes. Accordingly, false alarms are avoided.

3,603,958

ALARM DEVICE FOR WINDOW OR DOOR LOCK

Eric C. Wahlberg, 32 8th Ave., Stamford, Conn.

Continuation-in-part of application Ser. No. 490,176, Sept. 27, 1965, now abandoned. This application June 17, 1968, Ser. No. 747,056
Int. Cl. G08b *13/06*
U.S. Cl. 340—274 **7 Claims**



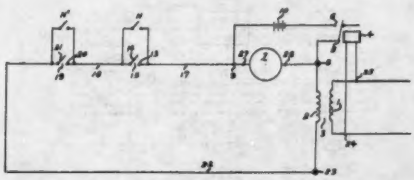
A unitary alarm device for use with window or door locks which signals unauthorized unlocking, opening or removal. The device is incorporated in the nonoperating portion of the lock assembly which may be used in present installations or new installations without alteration to structures. The device incorporates a structure for deactivating the alarm when unlocking, opening or removal of access structure is authorized.

3,603,959

WARNING INTERLOCK SYSTEM FOR UNLOCKED SAFES

Robert G. Dunn, and Emil J. Walk, Dayton, both of, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force

Filed Jan. 6, 1969, Ser. No. 789,278
Int. Cl. E05g *3/00*; G08b *13/08*
U.S. Cl. 340—274 **1 Claim**

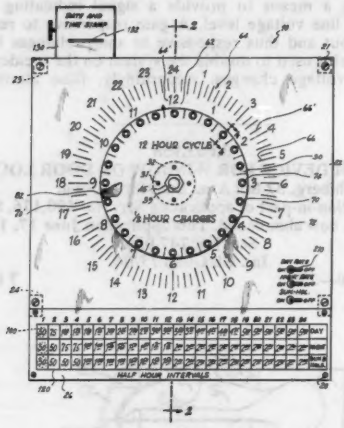


A warning interlock system which provides an audible signal when the passageway door is open to an enclosed area containing an unlocked safe. The invention incorporates the use of miniature switches in the passageway door casings and in the lock bolt recesses of safes. The miniature switch contacts are arranged so as to be closed when the corresponding passageway door and safe bolt are open. The closed contacts thus complete a first circuit causing the alarm to be energized. In another aspect of the invention, a relay is utilized in the system in order to complete a second circuit for energizing the alarm upon the loss of potential to the warning interlock system.

3,603,960
PARKING CHARGE DISPLAY DEVICE

Albert Sanchez, 47 Lincoln Ave., Staten Island, N.Y.

Filed Feb. 25, 1969, Ser. No. 801,990
Int. Cl. G07c 1/30
U.S. Cl. 340—309.1 9 Claims

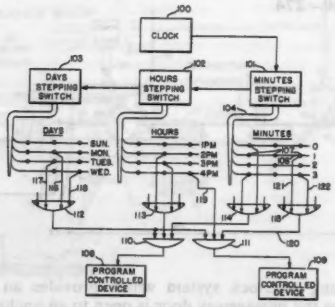


A parking charge display device has a rotating disk carrying circumferentially spaced switches. The disk is located in front of a clock dial. Spacing of the switches corresponds to time intervals for which parking charges are to be made. Pressing any switch lights one of a row of lamps located behind prices posted on a display panel. Inside the device is a distributor drum with conductive rings wiped by brushes and connected in circuit with the switches and lamps.

3,603,961
PROGRAMMED TIMING SYSTEM

Rudolph M. Duris, Norwalk, and Robert J. Spooner, Essex, both of, Conn., assignors to Edwards Company, Inc., Norwalk, Conn.

Filed Feb. 10, 1969, Ser. No. 798,004
Int. Cl. G04c 23/00, 23/14
U.S. Cl. 340—309.4 11 Claims

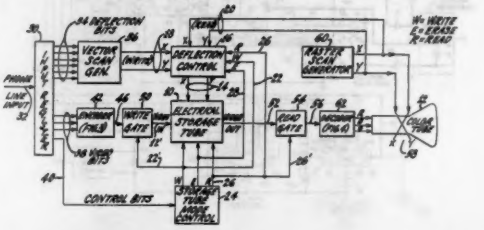


A clock mechanism drives day, hour and minute stepping switches which provide energization as time progresses of output circuits for their respective units of time. Matrices of terminals for days, hours and minutes respectively are energized from the output circuits. Control circuits are selectively programmed by energization through gates having input wires detachably connected to selected terminals of the several matrices.

3,603,962
COLOR DISPLAY FOR COMPUTER TERMINAL

Bernard Joseph Lechner, Princeton, N.J., assignor to RCA Corporation

Filed Mar. 18, 1970, Ser. No. 20,570
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A 4 Claims

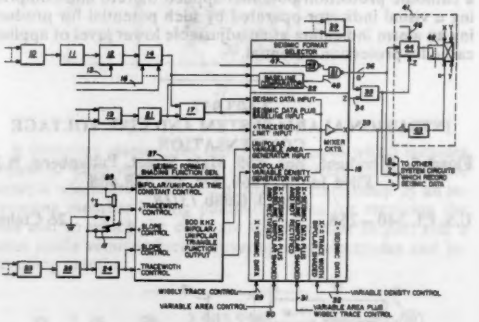


A color display system is disclosed which responds to computer-supplied digital signals representing graphic and alphanumeric material. The digital signals include position information bits and color information bits. The position information bits are used to control the beam deflection means of an electrical storage tube. The color information bits are translated in a digital-to-analog converter to a signal having an amplitude determined by the color information bits. This signal is applied to the video signal input terminal of the electrical storage tube, whereby the graphic material is stored as a pattern of stored charge amplitudes. The graphic material is displayed on a color kinescope having beam deflection means synchronized with the beam deflection means of the electrical storage tube. The amplitude-modulated video output signal from the electrical storage tube is applied to a threshold detector means to generate red, green and blue control signals for application to corresponding terminals of the color kinescope.

3,603,963
SEISMIC FORMAT GENERATOR

Phillip W. Ward, Arlington, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1967, Ser. No. 694,691
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A 3 Claims



A seismic format generator for transforming an analog seismic signal into either a wiggle trace format, a variable area format, variable area plus wiggle trace, or variable density format. A shading function generator supplies a unipolar and bipolar shading function to a format selector for the variable area and variable density formats. Input instructions to the format selector determine the selective combination of various input signals to produce a desired seismic format. The seismic format is displayed on a cathode-ray tube which

also receives a display blanking signal and an intensity modulating signal from the format selector.

3,603,964

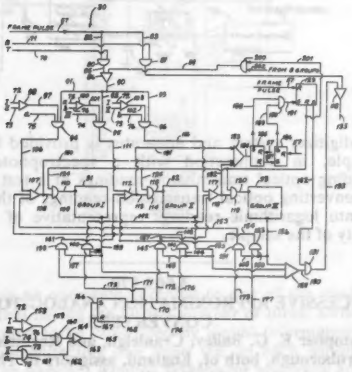
MEANS AND METHOD FOR SEMI-AUTOMATICALLY SEQUENCING THE GENERATION OF COMPONENTS FOR AN ELECTRONIC IMAGE DISPLAY

Lee Harrison, III, Englewood, Colo., assignor to Computer Image Corporation, Denver, Colo.

Continuation-in-part of application Ser. No. 607,078, Jan. 3, 1967, now Patent No. 3,364,382. This application Jan. 12, 1968, Ser. No. 697,512

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 A **10 Claims**



A network for sequencing the generation of parts for the display of an electronically generated image using signals established and controlled according to the viewing angle of the display subject. For sequencing purposes, parts of the display are assigned to sets of three groups connected in a closed loop. Depending upon the angle of viewing the display subject, selective transmission of enabling signals determines which group will start the sequence and in which order the other two groups will follow.

3,603,965

INFORMATION DISPLAY CIRCUIT INCLUDING MEANS FOR BLANKING THE DISPLAY DEVICE

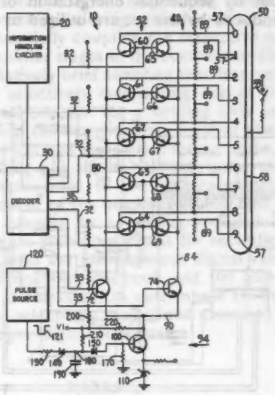
Arpad Somlyody, Raritan, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 15, 1968, Ser. No. 705,708

Int. Cl. G09f *9/46*; H01j *17/48*

U.S. Cl. 340—324 **1 Claim**

The disclosure is of a circuit which can be used in an information-handling and display system and includes a cathode glow display tube containing an anode and ten cathode electrodes which are coupled to a source of information signals in the system through a driving circuit. The driving circuit is a logic circuit which receives information signals from a decoder circuit and applies them to the cathode electrodes of the display tube, and the tube displays a number represented by the information signals when energizing potential is also applied to the tube anode. The driving circuit includes a control circuit which disables both the logic circuit and the display tube at desired times. The logic circuit includes five pairs of transistors connected in two groups with an auxiliary control transistor operating each group. The control circuit includes a transistor connected to the two control transistors for turning them off when desired to blank the display tube. A system is also disclosed for using the principles of the invention for controlling the timing of the application of information signals to the cathode electrodes and switching potentials to the anode electrodes of a series of display tubes in an information-handling instrument.



3,603,966

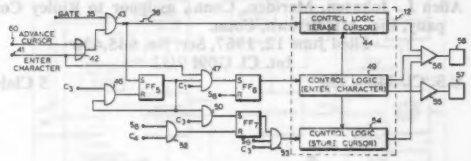
DATA DISPLAY SYSTEM

Roland S. Gregg, Jr., Canoga Park, and Herman F. Hoegeman, Jr., Thousand Oaks, both of, Calif., assignors to The Bunker-Ramo Corporation, Canoga Park, Calif.

Filed Feb. 14, 1969, Ser. No. 799,265

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 A **16 Claims**



A CRT data display system is provided with means for entering a character in memory for display in any position indicated by a cursor signal. Once a character has been entered, the cursor is automatically moved to the next character position in memory and displayed. The cursor may also be moved without entering a character. Character display is by a dot matrix such that *n* strokes are required to display a character and an additional stroke is required to provide an intercharacter space. The CRT beam is blanked during the additional stroke. The cursor signal is stored in a memory location read during the additional stroke period just preceding the position into which a character may be entered. Apparatus responds to the cursor signal a fraction of the time as the displayed data is repeatedly read for CRT regeneration, thereby displaying a blinking cursor. The cursor is displayed as a block in the character position accessible for entry, all without obliterating any character that may be present in that position.

3,603,967

CHARACTER GENERATOR

Markvard Hauerbach, San Diego, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif.

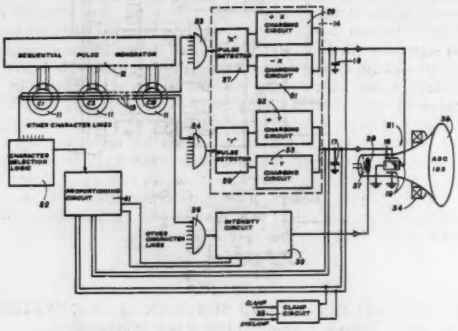
Filed Apr. 29, 1969, Ser. No. 820,118

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 A **36 Claims**

A character generator is described for producing deflection of a beam in a cathode-ray tube to generate selected

characters on its screen. Deflection information representing the selected character is generated by a set of wires (one set for each character) wound on a series of magnetic cores and is read out by sequential energization of the cores. The signals produced by the set are utilized to control charging



circuits which produce constant current output signals of appropriate sign representing increments of beam deflection to generate the selected character. The output signals are accumulated by a pair of storage means which are respectively adapted for connection to the horizontal and vertical deflection means of the cathode-ray tube.

3,603,968

MONITORING SYSTEM

Allen L. Johnson, Meriden, Conn., assignor to Ripley Company, Inc., Middletown, Conn.

Filed June 12, 1967, Ser. No. 645,430
Int. Cl. G09f 9/32
U.S. Cl. 340—336 **5 Claims**

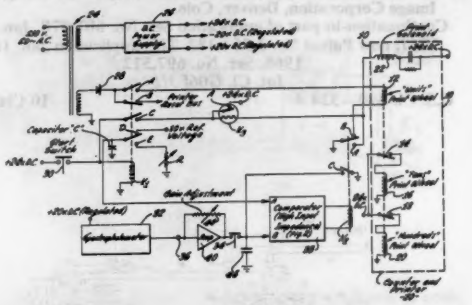
A system for displaying information from a plurality of metering registers, comprising a plurality of indicators, each of said indicators having a plurality of illumination means which, when actuated in a predetermined order, present symbols, gating means, and control means for providing signals to scan each of said registers in a predetermined order and then to control said gating means to provide signals representative of signals from said registers in the same said predetermined order, to provide signals to actuate said illumination means.

3,603,969

ELECTRONIC DIGITAL CONVERTER

Lamont J. Seitz, Tujunga, Calif., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed June 19, 1968, Ser. No. 738,169
Int. Cl. H03k 13/20
U.S. Cl. 340—347 AD **1 Claim**



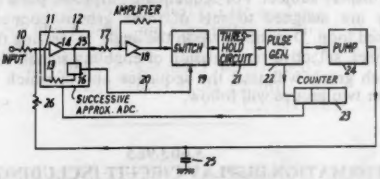
A digitizer system and apparatus is provided for use, for example, in conjunction with a spectrophotometer for providing optical transmission readings of a test sample, or for converting optical transmission readings of the test sample into logarithmic readings representative of the optical density of the sample.

3,603,970

SUCCESSIVE APPROXIMATION ANALOG-TO-DIGITAL CONVERTERS

Christopher E. G. Bailey, Cranleigh, and Reginald Catherall, Farnborough, both of, England, assignors to The Solartron Electronic Group Limited, Farnborough, Hampshire, England

Filed July 1, 1968, Ser. No. 741,538
Claims priority, application Great Britain, July 19, 1967, 33126/67
Int. Cl. H03k 13/06
U.S. Cl. 340—347 AD **5 Claims**



The range and discrimination of known successive approximation analog-to-digital converters have to be restricted undesirably in order to avoid digital errors of one or several bits in the readings. The invention avoids this problem by using a second, small range analog-to-digital converter to measure the residual analog error of the main converter when the latter has settled. The digital value provided by the second converter is preferably automatically added to (or subtracted from) the digital indication provided by the main converter.

3,603,971

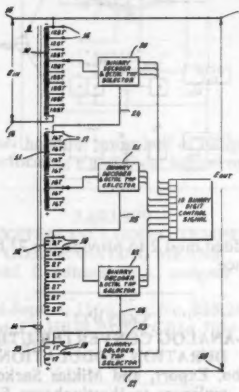
APPARATUS FOR CONVERTING BETWEEN DIGITAL AND ANALOG INFORMATION

Werner Woschetzky, West Redding, and Gerard T. Paul, Weston, both of, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 6, 1968, Ser. No. 750,528
Int. Cl. H03k 13/04
U.S. Cl. 340—347 DA **10 Claims**

Apparatus for converting digital information to an analog voltage which includes a transformer having an ordered plu-

rality of windings, all of which are magnetically flux linked and each of which corresponds to a digit of a digital number. Each winding is divided by output taps into a number of equal segments, the number being determined by the base of the digital number. The number of turns in the segments on each winding is determined by the power of the base represented by the digit to which the winding corresponds and by an arbitrary number of turns selected to correspond to the unit value of the digital number. Means are included



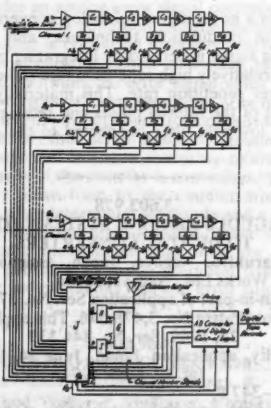
for supplying an operating potential to one of the windings, preferably that having the largest number of turns. Switching means, adapted to be controlled by digital information, are provided for connecting one input tap on each winding to one end of an adjacent winding. Means for providing an output voltage are connected to one end of the driven winding and the last output tap. preferably the output is connected to the low voltage end of the driven winding and each tap is connected by the switching means to the low voltage end of the next less significant winding.

3,603,972

AMPLIFIER SYSTEM

James R. Vanderford, Darien, Conn., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 24, 1968, Ser. No. 786,706
Int. Cl. H03k *13/02, 13/17*
U.S. Cl. 340—347 AD **60 Claims**



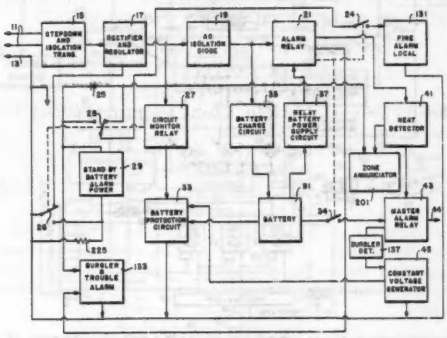
A wide dynamic range automatic high-speed digital gain ranging amplifier system having a plurality of amplifier stages coupled in cascade circuit relationship. The respective outputs of the amplifier stages are coupled through a common output circuit to a comparator circuit for comparison with a predetermined reference signal. Sequencing means are provided for momentarily closing switch means in timed sequence for sequentially coupling the respective outputs of the successive amplifier stages to the comparator circuit during successive, relatively brief sampling time intervals. Means are provided for selectively maintaining one of the switch means in its closed position for a holding time interval of longer duration than the sampling time interval when an output signal coupled through said switch means to the common output circuit during one of the sampling intervals bears a predetermined relationship to the reference signal. In a preferred embodiment of the amplifier system, the common output circuit is coupled to an analog-to-digital converter and thence to digital recording means for recording signals corresponding to both the instantaneous digital value of the signal at the common output circuit and the gain level to which the signal is amplified, as determined by the one of said switch means selectively maintained closed to pass the signal to the analog-to-digital converter.

3,603,973

COMBINATION FIRE AND BURGLAR ALARM SYSTEM

Howard O. Hough, 6 Squirrel Hill Road, Wayland, Mass.

Filed Apr. 11, 1968, Ser. No. 720,587
Int. Cl. G08b *19/00, 29/00;* H02j *9/00*
U.S. Cl. 340—409 **6 Claims**



A fire and burglar alarm system for providing automatic detection of a fire or burglary having active and passive components which are capable of operating at very low power levels continuously until the components are called upon to indicate a fire or burglary. The system is provided with alternate sources of power to insure the reliability of operation. Supervisory circuitry is provided for giving visual indication that all sensors and circuitry are in proper operating conditions. Annunciator circuitry is also provided to give visual indication of exact location or zone of conflagration.

3,603,974

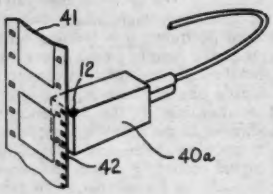
HIGH SPEED PHOTO-OPTICAL TIME RECORDING

Jesse T. Copeland, Jr., Cape Canaveral, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 31, 1969, Ser. No. 889,556
Int. Cl. G03b *17/24*
U.S. Cl. 346—23 **4 Claims**

An apparatus for placing a permanent time record on photographic film while being used in a high speed movie camera so as to indicate the exact time each frame of film is

exposed. A coded source of timing pulses is fed into an electronic circuit that includes an electroluminescent diode that



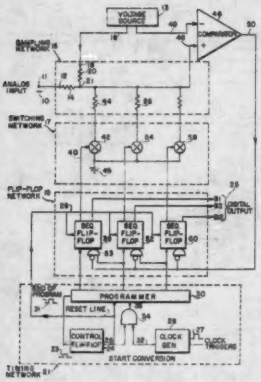
generates light signals corresponding to the timing pulses. These light signals are placed on the film in the camera.

3,603,975

DEVICE FOR ANALOG TO DIGITAL CONVERSION OR DIGITAL TO ANALOG CONVERSION

Bernard M. Gordon, Magnolia, Mass., assignor to Gordon Engineering Company, Watertown, Mass.

Filed Apr. 1, 1969, Ser. No. 811,781
Int. Cl. H03k *13/06*
U.S. Cl. 340—347 AD 9 Claims



In a successive approximation for converting analog data to digital form or digital data to analog form, the logically programmed sequence is switched at ground potential in order to eliminate transients of the type usually introduced by switching. In order to ensure great conversion accuracy, a voltage source is provided for generating precision reference signals that are extremely unresponsive to input voltage fluctuations.

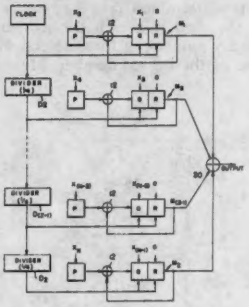
3,603,976

MODULAR ENCODER

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Tage O. Anderson, 628 Fairview Ave., Arcadia, Calif.

Filed Sept. 24, 1969, Ser. No. 860,751
Int. Cl. H03k *13/256*
U.S. Cl. 340—347 DD 5 Claims

A biorthogonal encoder of modular design with each module operating in a serial or cyclic mode. The number of modules M is equal to N/2 if N, the number of bits of the data word, is even, or to (N+1)2 if N is odd. Each module includes a 2-bit shift register, a storage bit and a mod 2 gate. The input to the register is a mod 2 function of the register's output and that of the storage bit. The outputs of all the M



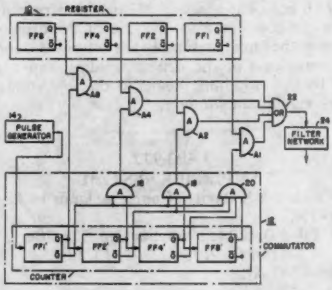
modules are added mod 2 to provide the 2^N bits of each code word in sequence.

3,603,977

DIGITAL-TO-ANALOG CONVERTER UTILIZING PULSE DURATION MODULATION

Andras I. Szabo, Export, and Miklos Sarkozi, Monroeville, both of, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 19, 1969, Ser. No. 834,710
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 DA 6 Claims



Described is a novel digital-to-analog converter employing pulse duration modulation techniques, and wherein the desired analog signal is derived by integrating pulses of short duration and relatively high repetition rate rather than longer pulses of lower repetition rate. This materially reduces the ripple content of the filtered pulses and reduces the requirements of the low-pass filter connected to the output of the converter.

3,603,978

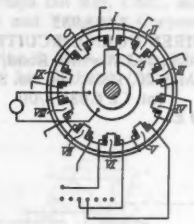
NONE-AMBIGUOUS READING SYSTEMS FOR ANALOG-TO-DIGITAL CONVERTERS

Yasumasa Narukiyo, Nagoya, Japan, assignor to Okuma Machinery Works Ltd., Nagoya, Japan

Continuation-in-part of application Ser. No. 376,689, June 22, 1964, now Patent No. 3,478,346. This application July 24, 1969, Ser. No. 844,339
Claims priority, application Japan, June 24, 1963, 38/33318
Int. Cl. G08c *9/04*
U.S. Cl. 340—347 P 8 Claims

Reading system free from ambiguity of reading at the boundary of two digits in which two *n*-digits code disks representing higher order digits and lower order digits are employed and three successive signals from said higher order code disk which generate signals, adjacent two signals of

which partially overlap each other, and two signals generated from said lower order disk respectively representing any

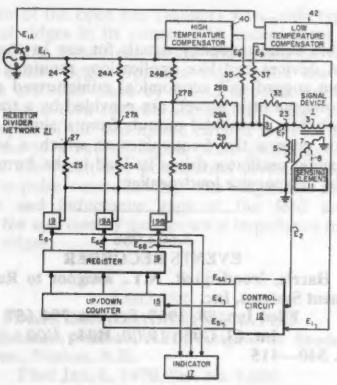


digits in the higher half and lower half of *n*-digits are fed to a logical circuit performing a particular logical operation.

3,603,979
DIGITAL SYSTEM INCLUDING TEMPERATURE COMPENSATING MEANS

Henry Kosakowski, Lyndhurst, N.J., assignor to The Bendix Corporation

Filed Sept. 4, 1969, Ser. No. 855,262
Int. Cl. H03k *13/17*; **G01d** *3/04*
U.S. Cl. 340—347 AD **6 Claims**



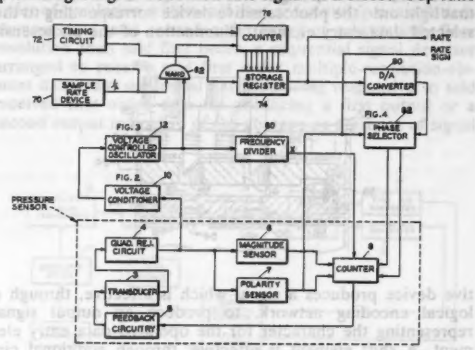
A two-speed system having a counter for providing a digital output corresponding to a condition in which a resolver provides an analog error signal corresponding to the difference between the condition and the digital output. The analog error signal is converted to pulses which are counted by the counter. Followup means connected to the counter and to the resolver nulls the error signal when the count in the counter corresponds to the condition. The null is defined by a pair of reference voltages and the count is stopped when the amplitude of the error signal is greater than one reference voltage and less than the other reference voltage. The counting rate of the counter is controlled by providing a high frequency pulse train to the counter when the error signal is above a predetermined amplitude and a low frequency pulse train when the error signal is below the predetermined amplitude. Independent high and low temperature compensation provides accurate operation over wide temperature range and eliminates trial and error adjustment.

3,603,980
DIGITAL RATE GENERATOR

Edgar W. VanWinkle, Rutherford; Henry R. Kosakowski, Lyndhurst, and Walter P. Hollinger, Ramsey, all of, N.J. assignor to The Bendix Corporation

Filed Oct. 3, 1969, Ser. No. 863,622
Int. Cl. H03k *13/20*
U.S. Cl. 340—347 AD **4 Claims**

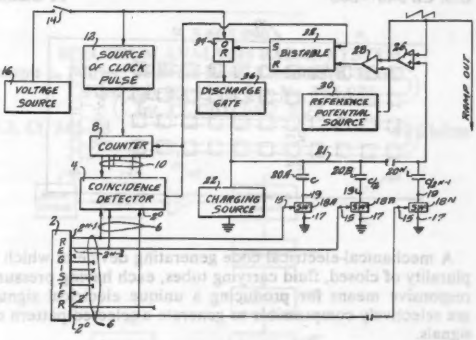
Apparatus associated with a digital condition sensor for providing a digital condition rate signal as a closed loop function of the sensed condition, and which signal is a continuous and precise measure of condition rate.



3,603,981
DIGITALLY CONTROLLED RAMP GENERATOR

David C. Rollenhagen, Urbana, Ill., and Wolfgang J. Poppelbaum, Syracuse, N.Y., assignor to The United States of America, as represented by the United States Atomic Energy Commission

Filed Oct. 10, 1969, Ser. No. 865,297
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 DA **3 Claims**



In response to the binary outputs of a register containing a binary number capacitive means are selectively connected to the output of a charging source to produce a ramp signal output having a slope proportional to the magnitude of the binary number. A coincidence circuit activates a discharge circuit connected to the capacitive means to terminate the ramp signal output in response to equality between the binary outputs of the register and the binary outputs of a counter accumulating the output of an adjustable clock pulse source.

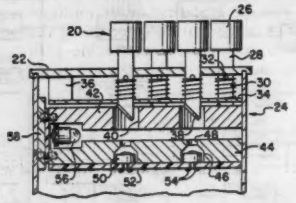
3,603,982
DATA ENTRY MEANS

David M. Patti, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed May 2, 1969, Ser. No. 821,311
Int. Cl. G06f *3/02*
U.S. Cl. 340—365 **20 Claims**

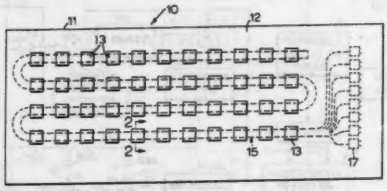
An electrooptical data entry means which uses reflected light as a means of encoding characters, each of which is represented by a data entry element. For each character, a photosensitive device is also provided, located in alignment with the corresponding data entry element in a lightproof housing. Also located in the housing is a light source which provides light between the data entry elements and the photosensitive devices. A reflective surface is mounted at an angle on each data entry element, and is so oriented with respect to the light source and the individual photosensitive device for that data entry means, that when a selected data entry device is operated, its reflective surface is moved, from a recess in which it is normally located, into a position which

causes it to intercept light from the light source and reflect that light onto the photosensitive device corresponding to the selected data entry element. Illumination of the photosensi-



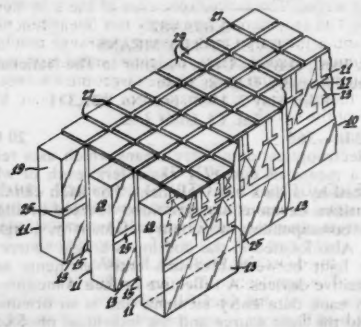
tive device produces a signal which is effective, through a logical encoding network, to produce an output signal representing the character for the operated data entry element. A shift element is effective, through additional circuitry, to produce a selected one of two possible output signal combinations represented by a given data entry element. Interlocks and various control functions are formed electronically.

3,603,983
MECHANICAL-ELECTRICAL CODE GENERATING DEVICE EMPLOYING FLUID SWITCHING
William Mitchell, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada
Filed July 23, 1969, Ser. No. 844,103
Int. Cl. G08c *19/00*
U.S. Cl. 340—365 **11 Claims**



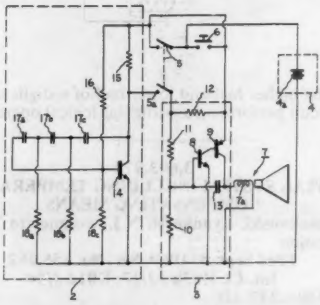
A mechanical-electrical code generating device in which a plurality of closed, fluid carrying tubes, each having pressure responsive means for producing a unique electrical signal, are selectively compressible to generate a selected pattern of signals.

3,603,984
PANEL STRUCTURE FOR MATRIX ADDRESSED DISPLAYS
George Harry Heilmeier, Yardly, Pa., and Louis Anthony Zanoni, Mercerville, N.J., assignors to RCA Corporation
Filed Sept. 24, 1969, Ser. No. 860,660
Int. Cl. G08b *5/36;* **G09f** *13/26*
U.S. Cl. 340—378 R **7 Claims**



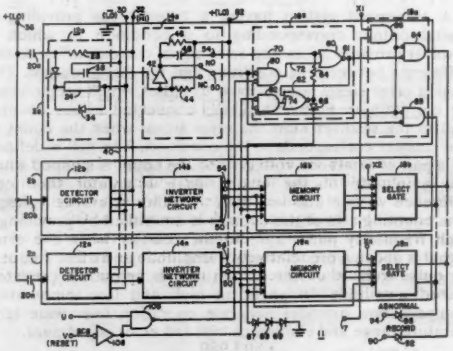
A panel for a matrix addressed device comprises a plurality of laminated plates having a portion of the matrix addressing circuitry at the laminated surfaces of the plates.

3,603,985
SIREN-HORN CIRCUITRY
Norman S. Goralnick, 233 Worthen Road, Lexington, Mass.
Filed May 20, 1969, Ser. No. 826,226
Int. Cl. G08b *3/00*
U.S. Cl. 340—384 E **5 Claims**



Variable audiofrequency signals for use in alarms, entertainment devices and like applications requiring sonic outputs from rugged and economical miniaturized equipments which consume little power, are provided by a transistorized circuit wherein sinusoidal outputs from a simple phase-shift oscillator govern the frequencies at which a voltage-controlled audio oscillator drives its load in the form of a voice coil of an inexpensive loudspeaker.

3,603,986
EVENTS RECORDER
Ben A. Harris, Irondequoit, N.Y., assignor to Rochester Instrument Systems, Inc.
Filed Jan. 28, 1969, Ser. No. 794,657
Int. Cl. G08b *19/00;* **H04q** *3/00*
U.S. Cl. 340—415 **8 Claims**



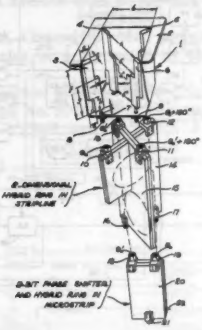
A sequential operations events recorder is disclosed wherein alarm points or circuits are monitored for providing a printed record in alphanumeric characters the changes in state or event of each of the alarm points or circuits in timed sequence. The first of a series of events is documented in printed form by the recorder to feature a "first out" indication.

3,603,987

POLARIZATION DIVERSITY RADIATOR FOR PHASED ARRAYS

Robert A. Witte, Playa Del Rey, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 6, 1969, Ser. No. 874,661
Int. Cl. H01q 13/00
U.S. Cl. 343—786 7 Claims



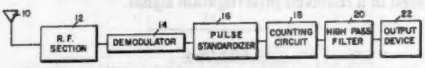
A radiator of the open end (square) waveguide type, having diagonal ridges in its corners. An independent coaxial feed through the closed end of the waveguide provides excitation to each ridge. Opposite ridge pairs are excited together on a 0°/180° basis by hybrid circuits. Each of the two hybrid inputs then controls one opposite ridge pair as a unit. The inputs of the two hybrid circuits are controlled in relative phase by a two-bit digital phase shifter and hybrid ring circuit. The result is a polarization diversity capability with pulse-to-pulse controllability. The ridges are tuned by capacitance and inductance gaps at the feed end and matched at the aperture by quarter wave impedance transformers in the ridges.

3,603,988

PULSE DENSITY DEMODULATOR

George L. Johnson, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jan. 6, 1970, Ser. No. 1,006
Int. Cl. G01s 9/02
U.S. Cl. 343—5 R 10 Claims



Pulse bursts are separated from background pulse trains by first standardizing the heights and widths of all incoming pulses. The standard pulses are passed to an averaging circuit, where the background pulses provide a DC or low frequency component in the output, whereas the arrival of a pulse burst causes a relatively rapid change in the output. These changes are detected from the background by means of a high pass filter.

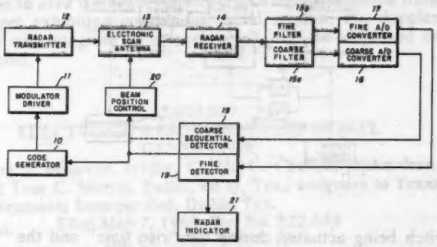
3,603,989

TWO-STAGE RADAR SYSTEM

James W. Caspers, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 7, 1965, Ser. No. 463,070
Int. Cl. G01s 9/02
U.S. Cl. 343—5 R 12 Claims

1. An improved multiple-resolution-element radar system comprising; means for developing multiple-resolution-element data having a first order of resolution; means for developing multiple-resolution-element data having a second order of resolution within said first order multiple-resolution-element data, said second order being of substantially finer resolution than said first order; a sequential signal detector arranged to receive said first order multiple-resolution-element data, said sequential detector being responsive to said received first order data for producing a first output or a second output indicative of the absence or presence of signal



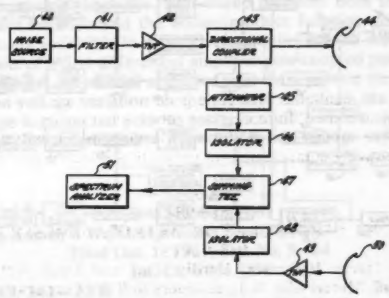
in said first order data, respectively; a second detector arranged to receive said second order multiple-resolution-element data, said second detector being operative for resolving the presence of signal within an incremental element of said second order of resolution and producing an output indicative thereof; and means responsive to said first output of said sequential detector or said output of said second detector for causing said system to develop a new sequence of multiple-resolution-element data.

3,603,990

SPECTRUM ANALYSIS RADAR SYSTEM

Joseph L. Poirier, 26 Brain Road, Chelmsford, Mass.

Filed July 23, 1968, Ser. No. 746,956
Int. Cl. G01s 9/02, 9/24
U.S. Cl. 343—5 10 Claims



A radar system and method in which the returned target signal is added to a reference signal derived from the original transmitted signal. The power spectrum of the sum signal is modulated. The modulation frequency is a linear function of the range and is measured to determine the range to a target. The transmitted signal must be time stationary (i.e., a noiselike signal) and the range to the target must be equal to or greater than the ratio of the speed of light divided by the bandwidth of the signal.

3,603,991

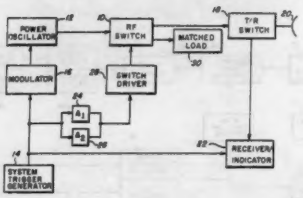
RADAR FREQUENCY SPECTRUM CONTROL CIRCUIT

Allen Bernstein, Framingham, Mass., and Stephen N. Miller, Haifa, Israel, assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 30, 1969, Ser. No. 870,078
This application filed under Rule 47
Int. Cl. G01s 9/02
U.S. Cl. 343—5 R 5 Claims

A pulse radar system wherein the frequency spectrum of each transmitted signal is narrower than the frequency spectrum of each pulse of radio frequency energy produced by

the system's power oscillator. The desired narrowing is accomplished by providing a microwave switch in the transmission line between the power oscillator and the antenna, such



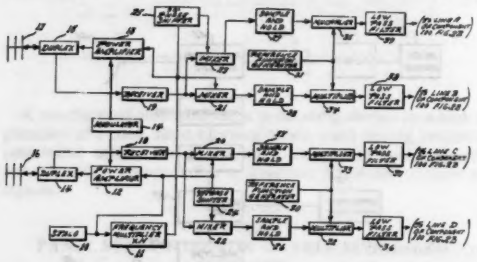
switch being actuated during the "rise time" and the "fall time" of each pulse out of the power oscillator to divert substantially all the power from the antenna during such times.

3,603,992

DUAL HARMONIC FREQUENCY SYNTHETIC APERTURE RADAR

William B. Goggins, Jr., Dayton, Ohio, and John K. Schindler, Chelmsford, Mass., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 13, 1969, Ser. No. 876,422
Int. Cl. G01s 9/02
U.S. Cl. 343—5 R **3 Claims**



A dual harmonic frequency synthetic aperture radar system in which synthetic aperture processing is used to achieve high angular resolution for two radars which operate at two or more harmonically related frequencies. These frequencies are related by the factor N. The processing is done so as to preserve the phase of the target return. After the synthetic aperture processing is completed, the phase angles are available at the two frequencies. The lower frequency phase angle is multiplied by N and compared with the phase angle at the upper frequency to obtain phase signature data on the target.

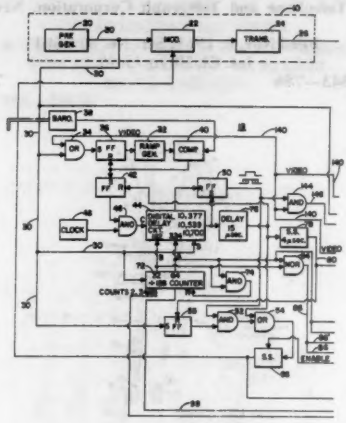
3,603,993

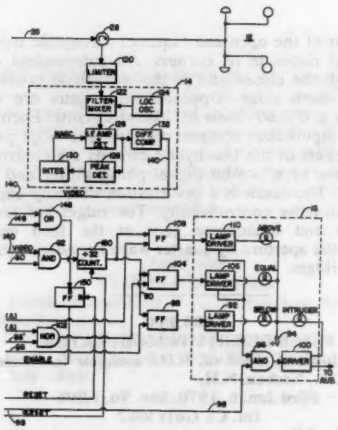
CONTROL APPARATUS

Robert J. Follen, Minneapolis; Charles P. Harman, Jr., St. Paul, and Jackie R. Meyer, Columbia Heights, all of, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 26, 1969, Ser. No. 861,244
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 LC **5 Claims**

A cooperative proximity warning system wherein interrogation signals from interrogating aircraft are modulated to scan the bands of altitude adjacent the altitude of the interrogator as well as the altitude of the interrogator and responses to the interrogations occur when the altitude of a





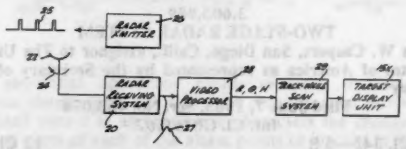
responding aircraft coincides with the altitude information contained in a received interrogation signal.

3,603,994

SYSTEM FOR AUTOMATICALLY GENERATING SMOOTHING PARAMETERS IN AN AUTOMATIC TRACK-WHILE-SCAN RADAR SYSTEM

Barry E. Williams, Downey, and Glenn B. Fitzpatrick, Anaheim, both of, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 26, 1966, Ser. No. 546,475
Int. Cl. G01s 9/14
U.S. Cl. 343—7.3 **12 Claims**



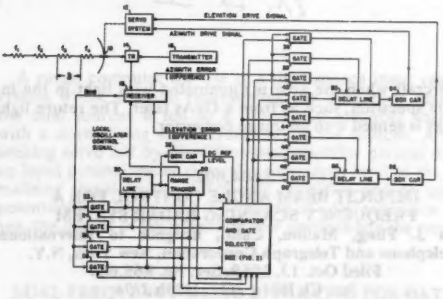
A system that generates variable rather than fixed velocity and position parameters to minimize the mean square

velocity and position errors in an automatic track-while-scan system. The velocity smoothing parameter is a function of the time between scans from which video signals from the particular target are received and a variably generated smoothing term. The position smoothing parameter is a function of the correlation criteria as well as of the smoothing term. The system operates to accurately and reliably track targets while maintaining scanning operations.

3,603,995
SIGNAL PROCESSOR FOR DIVERSITY FREQUENCY RADAR

Dean D. Howard, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy

Continuation-in-part of application Ser. No. 785,882, Dec. 23, 1968, now Patent No. 3,487,406. This application Dec. 16, 1969, Ser. No. 885,573
Int. Cl. G01s 9/16
U.S. Cl. 343—7.3 **7 Claims**

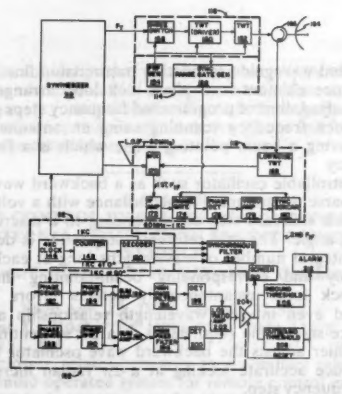


A pulse-to-pulse frequency diversity tracking radar wherein target angle scintillation is minimized by using only the frequencies giving the strongest echoes for tracking.

3,603,996
MEANS AND METHOD FOR DETECTING DOPPLER SIGNALS SUBMERGED IN CLUTTER

Jerre M. Murchison, and Alexander G. Antonio, both of Fort Worth, Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Filed Aug. 9, 1968, Ser. No. 752,733
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 **13 Claims**

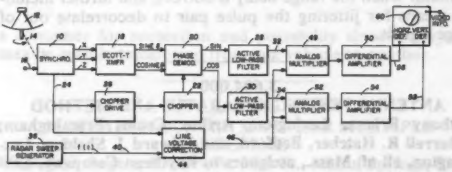


A subclutter, personnel detection coherent pulsed doppler radar system for discerning doppler signals submerged in clutter incorporating range gating, clutter rejection and clutter cancellation for use in a highly foliated environment, the received returns gated to eliminate all but those from the surveillance bin at a preselected range, the antenna pattern shaping the resolution cell in both azimuth and elevation. A filter system limits undesired received signals, the passed signal being separated into separate channels for receding or approaching targets, the outputs of the channels being subtracted and then integrated. Since foliage movement is fixed but pliable, the received clutter signal therefrom will integrate to zero voltage level, while with signals received from a target exhibiting continuous radial motion, the doppler signal will integrate to a level which may be displayed or recorded.

3,603,997
ELECTRONIC RESOLVED SWEEP SIGNAL GENERATOR

Jerome J. Brouwer, Irving; Gerald C. Church, Richardson, and Tom C. Morris, Dallas, all of, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 7, 1969, Ser. No. 822,644
Int. Cl. G01s 7/10, 7/12
U.S. Cl. 343—10 **18 Claims**

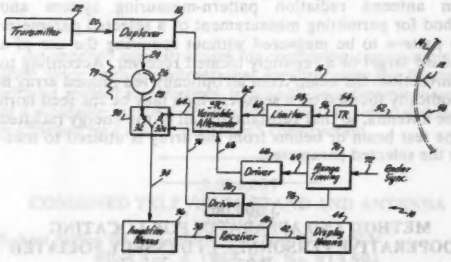


To display radar data on the face of a cathode-ray tube or other display device, it is necessary to generate product functions of the sine and the cosine components of the antenna position angle times the radar-sweep function. Both the sine product function and the cosine product function are electronically generated in respective multipliers. Each multiplier consists of a first differential amplifier pair coupled push-pull to a second differential amplifier pair. To minimize the effect of line voltage variation on the product functions, the sweep voltage is corrected prior to multiplication with the sine and cosine components in accordance with line voltage variation.

3,603,998
RADAR SYSTEM

Philip Kassel, 8 Woodridge Lane, Seacliff, N.Y.

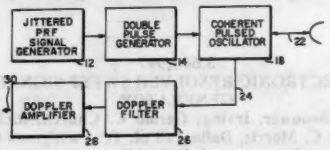
Filed Oct. 1, 1969, Ser. No. 9,464
Int. Cl. G01s 9/04
U.S. Cl. 343—12 R **7 Claims**



A height finding radar clutter and range improvement system is described having means for switching between a lowered beam pattern for transmission and a higher beam pattern for reception, thereby improving the signal to clutter ratio for near range and improving long range low altitude

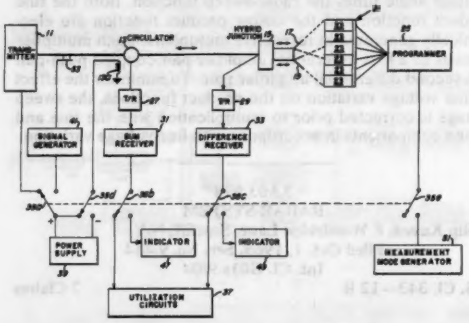
detection. The system includes means for effecting the switching as a function of time and range.

3,603,999
PULSED DOPPLER DETECTION SYSTEM
Benjamin Palleiko, Norwood, Mass., assignor to Sanders Associates, Inc., Nashria, N.H.
Filed Mar. 21, 1969, Ser. No. 809,263
Int. Cl. G01s 7/28
U.S. Cl. 343—17.1 **9 Claims**



Apparatus is herein disclosed for a pulsed doppler detection system comprising apparatus for generating pulsed pairs including a coherent pulsed oscillator wherein the return from target first pulse of a pair is mixed with the then currently generated second pulse of the same pair within the oscillator when the range delay is correct, and further including means for jittering the pulse pair to decorrelate out of range signals.

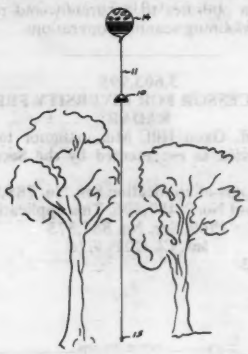
3,604,000
ANTENNA TESTING APPARATUS AND METHOD
Anthony Briana, Lexington; Arthur Crain, Framingham; Burrell R. Hatcher, Bedford, and Edward J. Sheldon, Lexington, all of, Mass., assignors to Raytheon Company, Lexington, Mass.
Filed July 31, 1969, Ser. No. 846,333
Int. Cl. G01s 7/40
U.S. Cl. 343—17.7 **5 Claims**



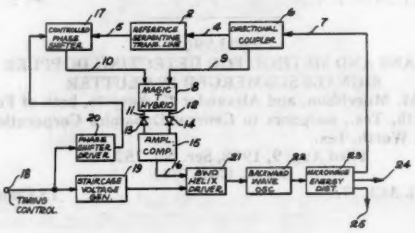
An antenna radiation pattern-measuring system and method for permitting measurement of a selected parameter of a pattern to be measured without requiring the use of a standard target or a remotely located receiver. According to the invention, the beam from an optically fed phased array is periodically focused on a sensor, which may be the feed horn of the antenna, so that substantially all of the energy radiated in the test beam or beams from the array is utilized to measure the selected parameter.

3,604,001
METHOD AND APPARATUS FOR LOCATING COOPERATIVE PERSONNEL IN DENSELY FOLIATED AREAS
Robert E. Deal, Dayton, Ohio
Filed Dec. 5, 1967, Ser. No. 690,698
Int. Cl. H01q 15/18
U.S. Cl. 343—18 C **1 Claim**

A balloon-filled with a gas such as helium supports a retroreflector on a line which is secured to the ground. The balloon supports the retroreflector above the trees and foliage. The retroreflector provides a position indication to an aircraft when the area is illuminated with light in the invisible spectrum, such as from a GaAs laser. The return light energy is sensed with an image converter.



3,604,002
IMPLICIT BEAM ANGLE CONTROL FOR A FREQUENCY SCANNING RADAR SYSTEM
John J. Fling, Malibu, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Oct. 13, 1969, Ser. No. 865,689
Int. Cl. H01q 3/22; H03b 3/04
U.S. Cl. 343—100 SA **10 Claims**

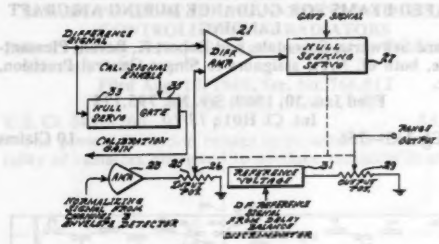


A folded waveguide serpentine transmission line is used as a reference element in a phase-lock loop arrangement for vernier adjustment of programmed frequency steps generated to produce frequency scanning using an antenna arrangement having a beam pointing angle which is a function of frequency.

A controllable oscillator such as a backward wave oscillator is coarse programmed in accordance with a voltage staircase, each staircase step corresponding to a discrete beam-pointing angle. The said reference serpentine is designed to be an integral number of wavelengths long at each discrete frequency and corresponding beam-pointing angle. The phase-lock loop instantaneously detects errors from the aforesaid even integral wavelength relationship across the reference serpentine (equivalent to a 2π serpentine output) and vernier adjusts the backward wave oscillator frequency to produce accurate locking at a 2π radian increment for each frequency step.

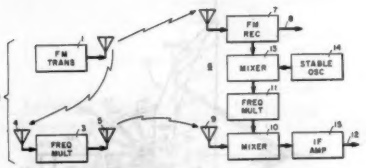
A controllable phase shifter in series with the reference serpentine operates to introduce a predetermined selected phase offset for scan interlacing.

3,604,003
RANGE COMPUTER
Michael Freier, and Leonard P. Balazer, both of Sunnyvale, Calif., assignors to Lockheed Missiles & Space Company, A Division of Lockheed Aircraft Corporation, Sunnyvale, Calif.
Filed Apr. 16, 1969, Ser. No. 817,614
Int. Cl. G01s 5/14, 11/00
U.S. Cl. 343—112 D 2 Claims



A range computer for use in a dual source input ranging system where a signal representing the difference between the dual sources is fed to a differential amplifier together with a normalizing signal from one of the sources. A null-seeking servo fed by the differential amplifier parallel drives an input potentiometer controlling the input level of the normalizing signal to the differential amplifier and an output potentiometer controlling the volume of a DC reference voltage, the output of the potentiometer representing the range.

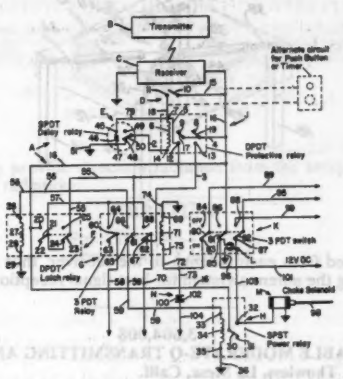
3,604,004
DUAL FREQUENCY RADIO APPARATUS FOR DATA TRANSMISSION AND DIRECTION FINDING
Edward M. Buyer, 74 Oak Road, Bayport, N.Y.
Filed Feb. 10, 1969, Ser. No. 797,870
Int. Cl. G01s 3/04
U.S. Cl. 343—113 6 Claims



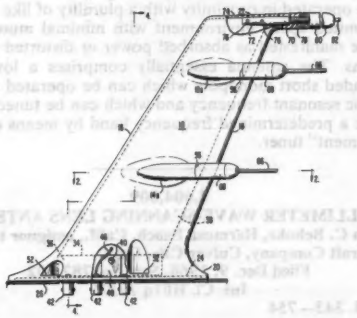
A system for radio direction finding on a transmitter station that sends information or data as modulation on a carrier of a frequency unsuitable for direction finding, by utilizing a higher frequency beacon signal derived from and frequency locked to the data transmission.

3,604,005
REMOTE CONTROL BY RELAYS OF COMPONENTS OF AN INTERNAL COMBUSTION ENGINE-POWERED VEHICLE
Ralph Edward Gilmore, 2760 N.W. 18th, Oklahoma City, Okla.
Filed Apr. 23, 1970, Ser. No. 31,305
Int. Cl. H04b 7/14; H02p 9/08; F02n 11/08
U.S. Cl. 343—225 9 Claims

The disclosure relates primarily to a compact relays-and-choke solenoid-operated system for remote control energization of electrical components of an internal combustion engine-operated vehicle. Electrically associated with the relays are a wireless transmitter and wireless receiver and various additional electrical components necessary for proper functioning of the system, most of which system is housed within a container for protection and portability since the system may be readily transferred from one vehicle to another.



3,604,006
AIRCRAFT MOUNTED MAST FOR MULTIPLE ANTENNAE
William C. Rogers, 5365 N.W. 36th St., Miami Springs, Fla.
Filed Dec. 11, 1968, Ser. No. 782,825
Int. Cl. H01q 1/28
U.S. Cl. 343—705 8 Claims

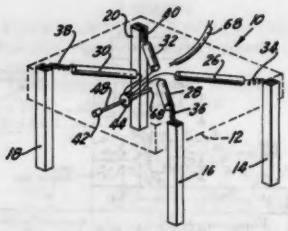


An antenna mast structure for combining communication, glide slope and omnidirectional localizer antenna functions without mutual interference in a small aerodynamic housing of a moldable material. Protection against accidental damage is afforded by a novel "deerhorn" construction.

3,604,007
COMBINED TELEVISION STAND AND ANTENNA SYSTEM
Robert Solby, 90 Riverside Drive, New York, N.Y.
Filed Apr. 4, 1969, Ser. No. 813,594
Int. Cl. H01q 1/00
U.S. Cl. 343—720 7 Claims

A combination stand or table and antenna system for television receivers, in which the legs of the stand are used as antenna segments. Two legs at opposite corners of the stand are used together to form one dipole antenna, and another

pair of legs is used to form a second dipole antenna. A circuit is provided for varying the proportion of the signal which is



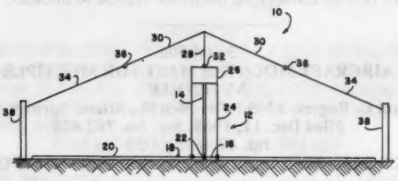
delivered from each antenna to the receiver, thus effectively rotating the antenna system for best signal reception.

3,604,008

TUNABLE MODERATE-Q TRANSMITTING ANTENNA

Eric A. Thowless, La Mesa, Calif.

Filed Jan. 14, 1970, Ser. No. 2,698
Int. Cl. H01q *9/00*
U.S. Cl. 343—745 **2 Claims**



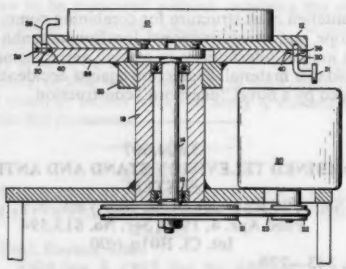
A tunable moderate-Q transmitting antenna. The antenna can be operated in proximity with a plurality of like antennas in a limited space environment with minimal mutual interference manifested as absorbed power or distorted radiation patterns. The antenna essentially comprises a low-profile, top-loaded short monopole which can be operated above its intrinsic resonant frequency and which can be tuned remotely over a predetermined frequency band by means of a "single-element" tuner.

3,604,009

MILLIMETER WAVE-SCANNING LENS ANTENNA

Marvin C. Behnke, Hermosa Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 9, 1968, Ser. No. 782,302
Int. Cl. H01q *17/06*
U.S. Cl. 343—754 **5 Claims**



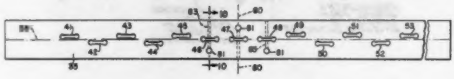
The apparatus of the present invention provides a high-speed mechanical scanner that operates in the millimeter range of frequencies with a cylindrical quartz lens as a focusing device. A split annular waveguide with one half in constant rotation provides 355° of scan and presents angular information as a function of time. The disclosed electromechanical scanner generates a 3° beam with 16 db. sidelobes and may be scanned at a rate in excess of 10,000 angular degrees per second.

3,604,010

ANTENNA ARRAY SYSTEM FOR GENERATING SHAPED BEAMS FOR GUIDANCE DURING AIRCRAFT LANDING

Leonard Schwartz, Scarsdale, and Robert K. Bevan, Pleasantville, both of, N.Y., assignors to Singer-General Precision, Inc.

Filed Jan. 30, 1969, Ser. No. 795,172
Int. Cl. H01q *13/10*
U.S. Cl. 343—756 **10 Claims**



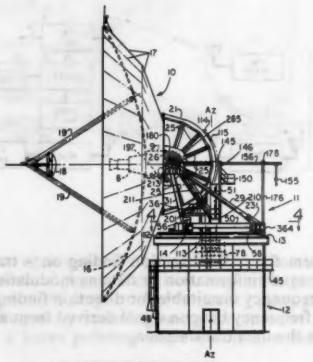
This specification discloses an antenna system for guiding aircraft during landing. The antenna system comprises slotted waveguides for generating radiobeams of the desired shape to provide wide coverage and eliminate false courses. The spacing between the slots and the coupling of the slots to the waveguides are individually selected to synthesize the desired beam shapes.

3,604,011

TURRET-TYPE LARGE APERTURE ANTENNA PRECISION MOUNTED ON CIRCULAR TRACK

Robert Dale Hall, La Mesa, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed Aug. 5, 1968, Ser. No. 750,444
Int. Cl. H01q *3/00*
U.S. Cl. 343—766 **8 Claims**



An elevation over azimuth turret-type antenna provides roller and track supports for rotational movement of a turret on a pedestal about an Az—Az axis and provides spaced pivots and drive wheels for rotational movement of the antenna reflector on the turret about an El—El axis. The roller supports include radially directed rollers for constraining the movement of the turret support rollers coaxially with their circular track and further include holddown roller elements for preventing the turret from leaving the track due to the eccentric loading of the reflector on the turret. A tubular shaft disposed coaxially of the Az—Az axis is secured to the turret

for rotation with it. The shaft extends upwardly through the several floors of the pedestal and through lower and upper rooms supported on the turret to which access is provided via an elevator mounted for operation within the shaft. An electronics room disposed between the spaced drive wheels increases the working area of the antenna, and bellows and jalousy ladder structures improve the access from the electronics room to functioning parts of the feed structure.

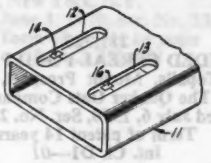
3,604,012

BINARY PHASE-SCANNING ANTENNA WITH DIODE CONTROLLED SLOT RADIATORS

Dale C. Lindley, Sunnyvale, Calif., assignor to Textron Inc., Belmont, Calif.

Filed Aug. 19, 1968, Ser. No. 766,012
Int. Cl. H01q 13/10
U.S. Cl. 343—768 **3 Claims**

The present invention relates to an antenna having a plurality of radiators energized to produce radiation in at least two adjacent quadrants and having control means for selectively reversing the phase of radiation of individual radiators



to thereby provide direction radiation from the array and to scan such radiation.

ERRATUM

For Class 346—23 see:
Patent No. 3,603,974

DESIGNS

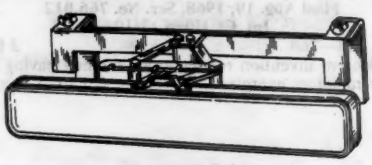
SEPTEMBER 7, 1971

221,723
EXPANDED CEREAL FOOD PRODUCT
Stylianos A. Topalis, Mount Prospect, Ill., assignor to The Quaker Oats Company
Filed July 6, 1970, Ser. No. 23,830
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—2

221,724
HEADGEAR FOR WRESTLERS
Bobby E. Douglas, 8 Boyd Ave., Bridgeport, Ohio 43912
Filed June 8, 1970, Ser. No. 23,363
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232

221,725
COMBINED PIN CUSHION AND BANK
Grace R. Tatum, M. R. Reesers Summit, New Cumberland, Pa. 17070
Filed Apr. 14, 1969, Ser. No. 16,757
Term of patent 3½ years
Int. Cl. D6—*99*
U.S. Cl. D3—19

221,726
ADJUSTABLE FOOTREST FOR BEDS
Charles B. Johnson, 1600 E. University, Des Moines, Iowa 50316
Filed Apr. 3, 1970, Ser. No. 22,238
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D5—4



221,727
HAND OPERATED WEED CUTTER
Oscar E. Erickson, 1933 E. 27th St., Hibbing, Minn. 55746
Filed July 6, 1970, Ser. No. 23,828
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—7

221,728
ADHESIVE DISPENSING GUN
Samuel R. Rosen, Lorain, Alan B. Reighard, Bay Village, Robert G. Baker, Avon, and Lawrence E. Blazey, Bay Village, Ohio, assignors to Nordson Corporation, Amherst, Ohio
Filed Feb. 12, 1970, Ser. No. 21,409
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—30

221,729
KNURLING TOOL
Merrill E. Williams, 162 Chelsa St., Stratford, Conn. 06497
Filed June 8, 1970, Ser. No. 23,360
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51

221,730
CLIP FOR SEALING PACKAGES AND THE LIKE
James W. Marietta, Jr., D-Mar, 116 W. 24th St., Los Angeles, Calif. 90007
Filed Sept. 18, 1969, Ser. No. 19,200
Term of patent 14 years
Int. Cl. D8—*03, 04*
U.S. Cl. D8—266

221,731
BOTTLE OR SIMILAR ARTICLE
Ted L. Beaver, Roselle, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Feb. 2, 1970, Ser. No. 21,215
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40

221,732
BOTTLE
Paul Andrew Lapidus, Monterey, Calif., and Jay Edward Melind, Elk Grove Village, Ill., assignors to American Can Company, New York, N.Y.
Filed June 1, 1970, Ser. No. 23,907
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—41

221,733
BOTTLE
Domas Adomaitis, Chicago, and Howard M. Turner, Oak Forest, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 14, 1969, Ser. No. 16,723
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—111

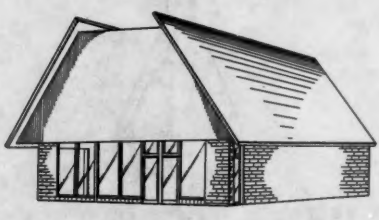
221,734
BOTTLE
Paul Andrew Lapidus, Monterey, Calif., and Jay Edward Melind, Elk Grove Village, Ill., assignors to American Can Company, New York, N.Y.
Filed June 1, 1970, Ser. No. 23,212
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—115

221,735
FORCING BAG FOR DECORATING PASTRY AND THE LIKE
John MacManus, 143—16 22nd Road, Whitestone, N.Y. 11357
Filed July 24, 1970, Ser. No. 24,112
Claims priority, application Great Britain Feb. 17, 1970
Term of patent 14 years
Int. Cl. D9—*06*
U.S. Cl. D9—194

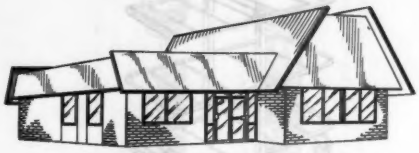
221,736
PULL TAB FOR A CONTAINER
Edward Charles Jacobs, Wauconda, and Burton Frank Pillnik, Cary, Ill., assignors to American Can Company, New York, N.Y.
Filed Aug. 3, 1970, Ser. No. 24,268
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—256

221,737
HANDLE FOR A CONTAINER
Richard C. Rheinhart, North Aurora, Ill., assignor to American Can Company, New York, N.Y.
Filed Mar. 25, 1970, Ser. No. 22,057
Term of patent 14 years
Int. Cl. D9—*99*; D8—*03*
U.S. Cl. D9—291

221,738
FOOD SERVICE BUILDING
James T. Hight, Darien, Conn., assignor to American Dairy Queen Corporation, Minneapolis, Minn.
Filed Apr. 14, 1969, Ser. No. 16,709
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



221,739
FOOD SERVICE BUILDING
James T. Hight, Darien, Conn., assignor to American Dairy Queen Corporation
Filed Mar. 17, 1970, Ser. No. 21,928
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

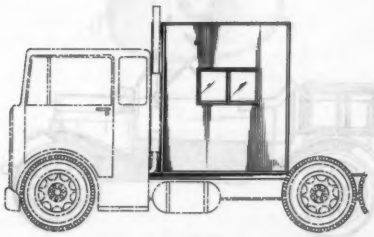


221,740
FOOD SERVICE BUILDING
James T. Hight, Darien, Conn., assignor to American Dairy Queen Corporation
Filed Mar. 17, 1970, Ser. No. 21,935
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

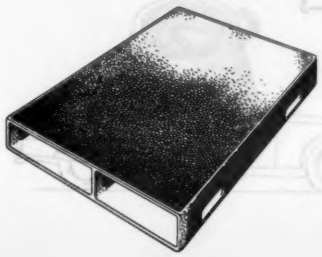
221,741
FOOD SERVICE BUILDING
James T. Hight, Fairfield, Conn., assignor to American Dairy Queen Corporation
Filed Mar. 17, 1970, Ser. No. 21,936
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

221,742
WINDOW SASH GUIDE
Arthur M. Starck, and William R. Starck, Greenwich, Conn., assignors to A.M.S. Corporation, South Norwalk, Conn.
Filed Feb. 24, 1970, Ser. No. 21,570
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—6

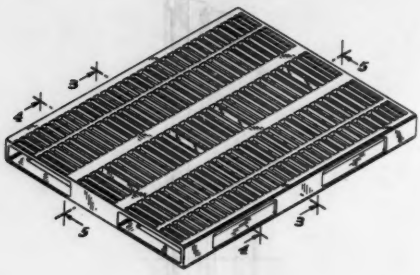
221,743
SLEEPER VAN
Kenneth O. Cunningham, 3948 Adams 83704, and Ray Montgomery, Rte. 2, Dalton Lane 83702, both of Boise, Idaho
Filed Mar. 9, 1970, Ser. No. 21,830
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—3



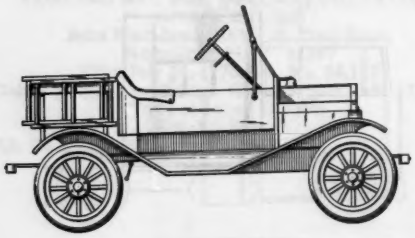
221,744
PALLET
Vincent B. Cetrone, and Albert J. Sopko, Warren, Ohio, assignors to Warren Industrial Manufacturing & Sales Company, Warren, Ohio
Filed Mar. 30, 1970, Ser. No. 22,113
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D14—3



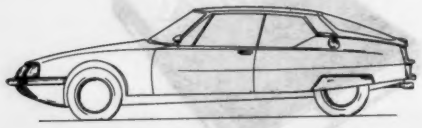
221,745
PALLET
Ernest Cardwell Holdredge, Decatur, Ga., and Larry Lee Marifjeren, Scotch Plains, N.J. assignors to Allastics, Inc., Norcross, Ga.
Filed June 1, 1970, Ser. No. 23,213
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—3



221,746
FIRE TRUCK
Michael Dennis Callahan, 17011 Dover Lane, Independence, Mo. 64056
Filed Apr. 10, 1970, Ser. No. 22,369
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3

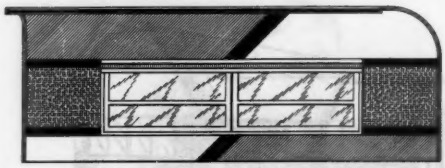


221,747
AUTOMOBILE
Henri Fabien, Bagneux, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France
Filed Aug. 14, 1970, Ser. No. 24,486
Claims priority, application France Feb. 23, 1970
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3



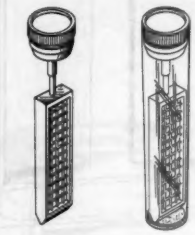
221,748
WHEELED CART
Harold Bloomfield and Melvin F. Roberts, Chicago, Ill., assignors to Bloomfield Industries, Inc., Chicago, Ill.
Filed Sept. 8, 1970, Ser. No. 24,874
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D14—3

221,749
SIDE PANEL FOR CAMPING COVER FOR PICK-UP TRUCKS
Don J. Reynolds, 7202 Overton, Raytown, Mo. 64133
Filed Dec. 29, 1969, Ser. No. 20,689
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D14—6



221,750
OVERHEAD GUARD
William P. Downey, Portland, and Richard H. Hunger, Oregon City, Oreg., and Niels Diffrient, New York, N.Y., assignors to Hyster Company, Portland, Oreg.
Filed Oct. 14, 1969, Ser. No. 19,552
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—27

221,751
BACTERIURIA TEST DEVICE
Donald P. Kronish, Rockaway, and Lee S. Zuriff, Parsippany, N.J., assignors to Warner-Lambert Pharmaceutical Company, Morris Plains, N.J.
Filed Mar. 25, 1970, Ser. No. 22,047
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—1



221,752
BATH BENCH
William R. Brewer, 9100 Bartee Ave., Arleta, Calif. 91331
Filed Dec. 15, 1967, Ser. No. 9,803
Term of patent 14 year
Int. Cl. D6—*01*
U.S. Cl. D15—8

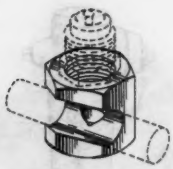
221,753
FIRE HYDRANT
John J. Smith, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.
Filed July 8, 1970, Ser. No. 23,856
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—12

221,754
FIRE HYDRANT
John J. Smith, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.
Filed July 8, 1970, Ser. No. 23,857
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—12

221,755
TABLE FOUNTAIN
Ernest R. Johnson, 2023 Mulford St., Camden, N.J. 08104
Filed May 31, 1966, Ser. No. 2,460
Term of patent 7 years
Int. Cl. D23—*01*
U.S. Cl. D23—13

221,756
SPRAY AERATOR
E Burton Benjamin, Highland Park, Ill., assignor to Wrightway Engineering Co., Chicago, Ill.
Filed Nov. 25, 1969, Ser. No. 20,272
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

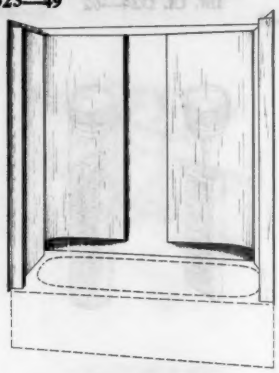
221,757
VALVE RECEIVING TUBING CLAMP
John W. Mullins, P.O. Box 20524, Oklahoma City, Okla. 73120
Filed Nov. 10, 1969, Ser. No. 20,011
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40

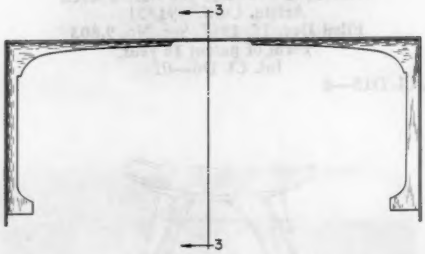


221,758
VALVE RECEIVING TUBING CLAMP
John W. Mullins, P.O. Box 20524, Oklahoma City, Okla. 73120
Filed Nov. 3, 1969, Ser. No. 19,921
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40

221,759
CORRUGATED TUBE
Joseph F. Bauman, Trenton, N.J., and Adrian V. Cini, Levittown, Pa., assignors to Acme-Hamilton Manufacturing Corporation, Trenton, N.J.
Filed Oct. 14, 1969, Ser. No. 19,551
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—45

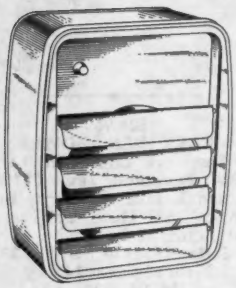
221,760
SHOWER ENCLOSURE WALL UNIT
Norman Van Skyhawk, Salt Lake City, Utah, assignor to American Standard Inc., New York, N.Y.
Filed May 21, 1969, Ser. No. 17,250
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



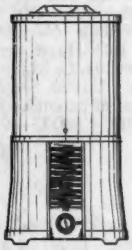


221,761
ANDIRON
Judkins E. Wilkinson, Birmingham, Ala., assignor to Atlanta Stove Works, Inc.
Filed Nov. 28, 1969, Ser. No. 20,312
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—102

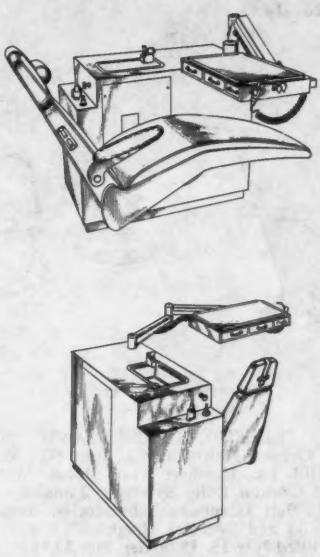
221,762
ELECTRIC SPACE HEATER
Alben C. Boggs, Pittsburgh, and Joseph R. Nelis, Wilmerding, Pa., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Apr. 23, 1970, Ser. No. 22,607
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—111



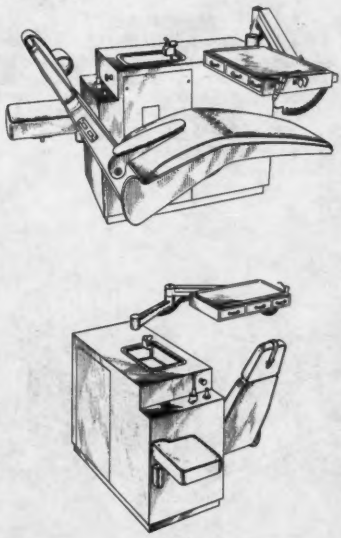
221,763
COMBINED AIR PURIFIER AND DEODORIZER
John E. Gilbertson, 3209 Douglas Ave., Des Moines, Iowa 50310
Filed Apr. 6, 1970, Ser. No. 22,285
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—149



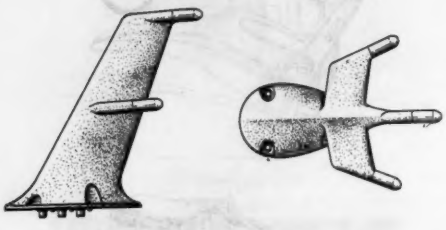
221,764
DENTAL UNIT
Reece W. Johnston, Fort Worth, Tex., assignor to Unitek Corporation, Fort Worth, Tex.
Filed June 1, 1970, Ser. No. 23,216
Term of patent 14 years
Int. Cl. D24—*03*; D6—*01*
U.S. Cl. D24—1



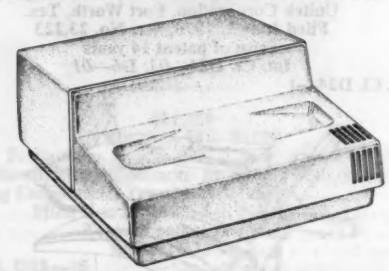
221,765
DENTAL UNIT
Reece W. Johnston, Fort Worth, Tex., assignor to Unitek Corporation, Fort Worth, Tex.
Filed June 1, 1970, Ser. No. 23,223
Term of patent 14 years
Int. Cl. D24—*03*; D6—*01*
U.S. Cl. D24—1

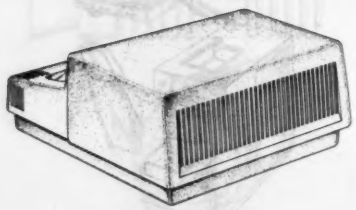


221,766
AIRCRAFT RADIO ANTENNA
William C. Rogers, 5365 NW. 36th St., Miami Springs, Fla. 33166
Filed Jan. 15, 1970, Ser. No. 20,944
Term of patent 14 years
The portion of the term of the patent subsequent to May 27, 1983, has been dedicated to the Public
Int. Cl. D14—*03*
U.S. Cl. D26—14

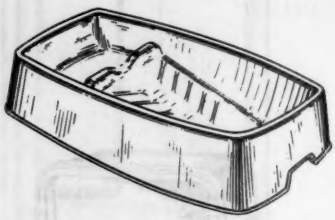


221,767
TELEPHONE DESK STAND
Donald M. Genaro, Haworth, N.J., John Niel McGarvey, Drexel Hill, Pa., Rembert Ryan Stokes, Middletown, N.J., and Gordon Elliot Sylvester, Jamaica, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.
Filed July 15, 1970, Ser. No. 23,963
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

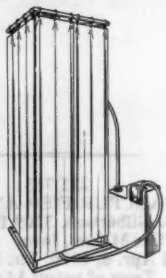




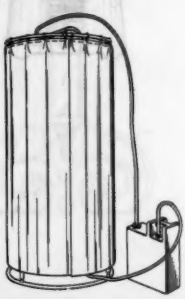
221,768
INFANT'S BATHTUB
John Savedra, Downsview, Ontario, Canada, assignor to Tek Plastics Limited, Malton, Ontario, Canada
Filed Mar. 30, 1970, Ser. No. 22,105
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—52



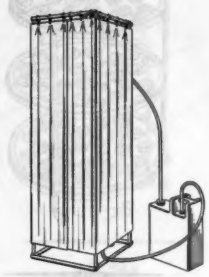
221,769
PORTABLE SHOWER
George T. Le Blanc and Clifford H. Le Blanc, both of P.O. Box 1914, Beaumont, Tex. 77704, and Thomas A. Balmer, and Bobbie G. Hurst, Beaumont, Tex.; said Balmer and said Hurst assignors to George T. Le Blanc and Clifford H. Le Blanc
Filed May 15, 1970, Ser. No. 23,000
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—57



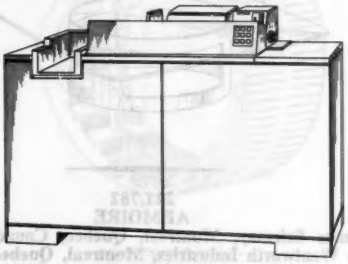
221,770
PORTABLE SHOWER
George T. Le Blanc and Clifford H. Le Blanc, both of P.O. Box 1914, Beaumont, Tex. 77704, and Thomas A. Balmer, and Bobbie G. Hurst, Beaumont, Tex.; said Balmer and said Hurst assignors to George T. Le Blanc and Clifford H. Le Blanc
Filed May 15, 1970, Ser. No. 22,999
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—57



221,771
PORTABLE SHOWER
George T. Le Blanc and Clifford H. Le Blanc, both of P.O. Box 1914, Beaumont, Tex. 77704, and Thomas A. Balmer and Bobbie G. Hurst, Beaumont, Tex.; said Balmer and said Hurst assignors to George T. Le Blanc and Clifford H. Le Blanc
Filed May 15, 1970, Ser. No. 22,998
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—57

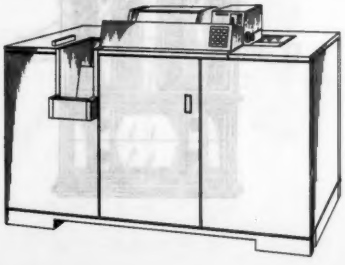


221,772
ELECTRONIC ACCOUNTING MACHINE
Clifford I. Shelkofsky, Endwell, Edward R. Wiener and Ernest Wittner, Vestal, and Edward L. Brown, Carmel, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 8, 1969, Ser. No. 19,047
Term of patent 14 years
Int Cl. D14—*02*
U.S. Cl. D26—5

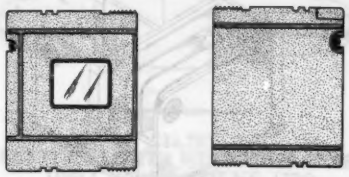


221,773
ELECTRONIC ACCOUNTING MACHINE
Clifford I. Shelkofsky, Endwell, Edward R. Wiener and Ernest Wittner, Vestal, and Edward L. Brown, Carmel, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 8, 1969, Ser. No. 19,058
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

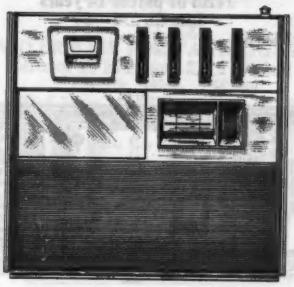
FIG. 1 is a front perspective view of an electronic



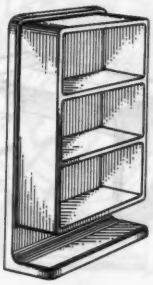
221,774
CARTRIDGE USED FOR RECORDING AND REPRODUCING
Tamao Ikuta and Shozo Moriya, Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 21, 1970, Ser. No. 23,085
Term of patent 14 years
Int. Cl. D14—*01*; D16—*99*
U.S. Cl. D26—14



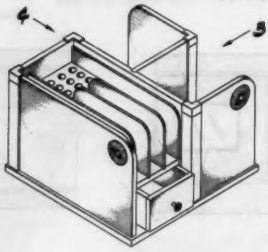
221,775
COMBINED RADIO AND CASSETTE TAPE RECORDER OR SIMILAR ARTICLE
John S. Maliskas, North Syracuse, N.Y., assignor to General Electric Company
Filed June 5, 1970, Ser. No. 23,336
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



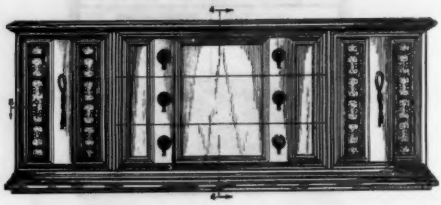
221,776
BOOKCASE
Douglas Deeds, San Diego, and Barry L. Rosengrant, Los Angeles, Calif., assignors to Architectural Fiberglass, Inc., Los Angeles, Calif.
Filed Jan. 19, 1970, Ser. No. 20,968
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—2



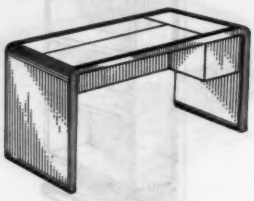
221,777
ARTICLE HOLDER FOR USE ON A DESK
Herbert M. Rose, Los Angeles County, Calif.
Filed Apr. 10, 1970, Ser. No. 22,362
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D33—3



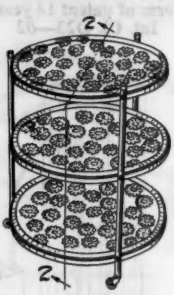
221,778
DRESSER OR SIMILAR ARTICLE
Thomas Szirmay, Montreal, Quebec, Canada, assignor to Wentworth Industries Limited, Montreal, Quebec, Canada
Filed Apr. 14, 1969, Ser. No. 16,708
Claims priority, application Canada Oct. 15, 1968
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—6



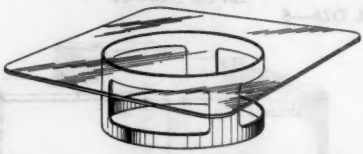
221,779
DESK
Douglas Deeds, San Diego, and Barry L. Rosengrant, Los Angeles, Calif., assignors to Architectural Fiberglass, Inc., Los Angeles, Calif.
Filed Jan. 19, 1970, Ser. No. 20,967
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—7



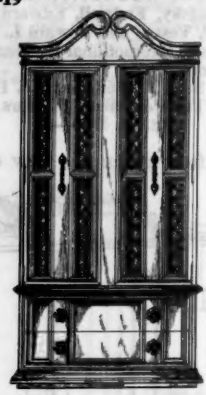
221,780
3-TIER PATIO TABLE
Alan Bedol, Shaker Heights, Ohio, assignor to The Marshallan Manufacturing Company, Cleveland, Ohio
Filed Mar. 13, 1970, Ser. No. 21,889
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14



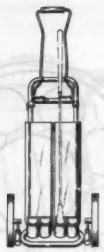
221,781
TABLE
Robert A. Caigan, 1134 1st Ave. New York, N.Y. 10021, and Gideon Loewenstein, 39—37 46th St., Long Island City, N.Y. 11104
Filed May 7, 1970, Ser. No. 22,883
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14



221,782
ARMOIRE
Thomas Szirmay, Montreal, Quebec, Canada, assignor to Wentworth Industries, Montreal, Quebec Canada
Filed Apr. 14, 1969, Ser. No. 16,713
Claims priority, application Canada Oct. 15, 1968
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D33—19

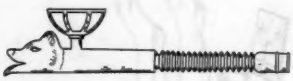


221,783
GOLF CLUB CARRIER
Henry P. Yokers, Menomonee Falls, Wis., assignor to Sit 'N Rest Golf, Inc., Milwaukee, Wis.
Filed Apr. 23, 1968, Ser. No. 11,581
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5



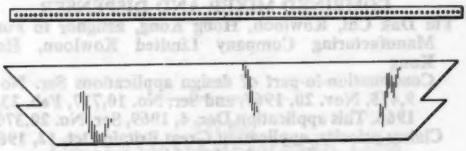
221,784
ROLLING TOY
John A. Gale, 978 E. Shady Lane, Wayzata, Minn. 55391, and Donald Delone Heinz, 2403 Lincoln St. NE., Minneapolis, Minn. 55418
Filed Mar. 18, 1970, Ser. No. 21,948
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

221,785
TOY BLOW PIPE
Zaki Ishag, London, England, assignor to Commodex Limited, London, England
Filed Apr. 22, 1970, Ser. No. 22,570
Claims priority, application Great Britain Dec. 5, 1969
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

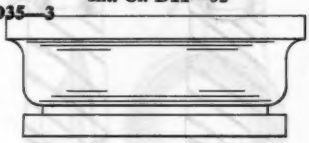


221,786
FLEXIBLE BALL PROJECTOR TOY OR SIMILAR ARTICLE
Walter F. Hayne, P.O. Box 4688, Oakland, Calif. 94597
Filed June 12, 1970, Ser. No. 23,455
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

221,787
PLASTIC FLOWER WINDOW PLANTER
Dale C. Rucker, 1205 NE. 113th, Portland, Oreg. 97229
Filed Nov. 12, 1968, Ser. No. 14,382
Term of patent 3½ years
Int. Cl. D11—*02*
U.S. Cl. D35—3



221,788
PLANTER BASE FOR YARD LIGHT POLE
Herman E. Erickson, 2325 W. 2nd St., Duluth, Minn. 55806
Filed May 15, 1970, Ser. No. 23,001
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3



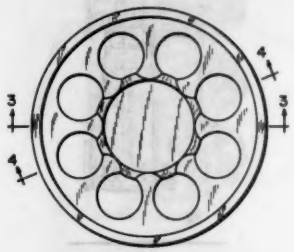
221,789
WATCH
Jack Kolbrener, New York, N.Y., assignor to Invicta Societe Anonyme, La Chaux-de-Fonds, Switzerland
Filed Nov. 21, 1969, Ser. No. 20,216
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D42—8

221,790
MIXER
Henricus Franciscus Theresia Schellens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 3, 1968, Ser. No. 14,756
Claims priority, application Switzerland June 5, 1968
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D44—1

221,791
COMBINED MIXER AND DISPENSER
Yiu Dak Chi, Kowloon, Hong Kong, assignor to Forda Manufacturing Company Limited Kowloon, Hong Kong
Continuation-in-part of design applications Ser. No. 9,475, Nov. 20, 1967, and Ser. No. 10,737, Feb. 23, 1968. This application Dec. 4, 1969, Ser. No. 20,370
Claims priority, application Great Britain Oct. 12, 1967
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D44—1

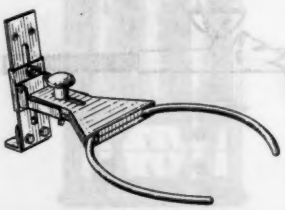
221,792
BEATER
Glenn M. Moffatt, Thornhill, Ontario, and Allan T. Thomas, Downsview, Ontario, Canada, assignors to Samson Dominion Limited, Scarborough, Ontario, Canada
Filed Mar. 2, 1970, Ser. No. 21,695
Term of patent 7 years
Int. Cl. D7—*04*
U.S. Cl. D44—1

221,793
CANDLE WARMER OR THE LIKE
Ronald G. DePuy, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed July 30, 1970, Ser. No. 24,223
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—10



221,794
CONDIMENT SHAKER
Mel Appel, Livingston, and Martin Schnur, Fort Lee, N.J., assignors to Gemco-Ware Inc., Freeport, N.Y.
Filed Feb. 10, 1970, Ser. No. 21,394
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D44—22

221,795
POT HOLDER
Albert E. Jenks, P.O. Box 311, Rte. 1, Olathe, Kans. 66061
Filed June 1, 1970, Ser. No. 23,227
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—29

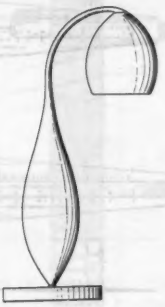


221,796
COFFEE MAKER
Richard W. Greger, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed July 20, 1970, Ser. No. 24,041
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—26

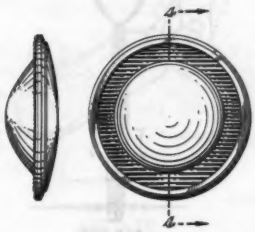
221,797
RING
Robert H. Annesley, Houston, Tex., assignor to Stuckey and Speer, Inc., Houston, Tex.
Filed Sept. 10, 1970, Ser. No. 24,940
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10

221,798
PANTY HOSE SIZING FORM
Robert E. Merritt, Mount Airy, N.C., assignor to Renfro Hosiery Mills Company, Mount Airy, N.C.
Filed Nov. 20, 1969, Ser. No. 20,190
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D47—5

221,799
LAMP
Marion E. Johnson, 784 Hall Road, Dahlgren, Va. 22448
Filed Feb. 9, 1970, Ser. No. 21,631
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—20

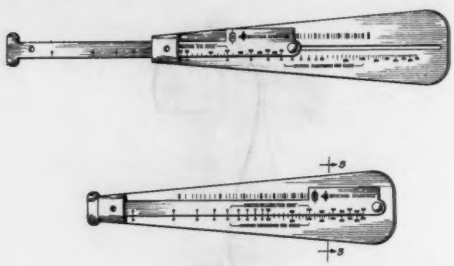


221,800
FLUTED CONVEXO-ASPHERIC LENS
Howard A. Schaefer, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Apr. 2, 1970, Ser. No. 22,208
Term of patent 14 years
Int. Cl. D26—*06, 99*
U.S. Cl. D48—32



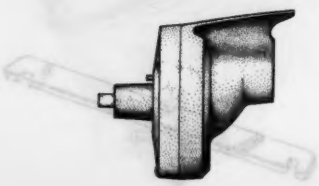
221,801
DISPENSING GUIDE FOR A BOXED COIL OF WIRE
Guido Zecchin, Winsted, Conn., assignor to Hudson Wire Company, Ossining, N.Y.
Filed Sept. 10, 1969, Ser. No. 19,086
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D52—1

221,802
SLIDE RULE
Addison W. Learned III, and Rosalie C. Learned, both of 88 Dorset Road, Holliston, Mass. 01746
Filed Sept. 2, 1969, Ser. No. 18,962
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D52—6

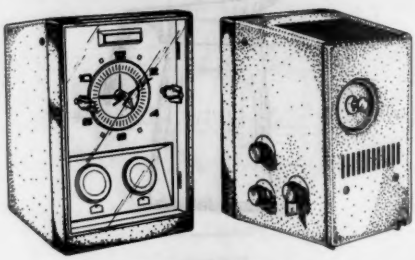


221,803
SPOON OR SIMILAR ARTICLE
James Russell Price, Esmond, R.I., assignor to Gorham Division of Textron Inc., Providence, R.I.
Continuation-in-part of design application Ser. No. 19,088, Sept. 10, 1969. This application Aug. 4, 1970, Ser. No. 24,304
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

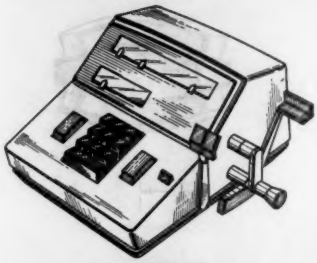
221,804
SPEED INCREASER ATTACHMENT FOR FOOD MACHINES
Richard S. Hartley, Troy, Ohio, assignor to The Hobart Manufacturing Company, Troy, Ohio
Filed May 25, 1970, Ser. No. 23,111
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D55—1



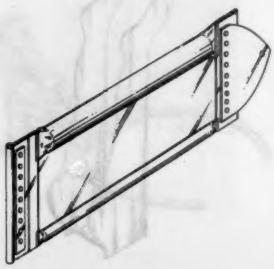
221,805
COMBINED RADIO RECEIVER AND CLOCK OR SIMILAR ARTICLE
Benito Mishiro and Haruhiro Koga, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed July 1, 1970, Ser. No. 23,798
Claims priority, application Japan Mar. 20, 1970
Term of patent 14 years
Int. Cl. D10—*01*; D14—*03*
U.S. Cl. D56—4



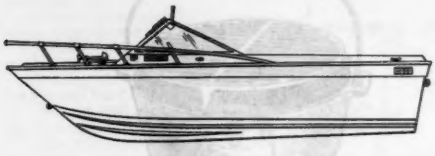
221,806
CALCULATING MACHINE
Alfons Boothby and Georg Joseph, Wilhelmshaven, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany
Filed Jan. 16, 1969, Ser. No. 15,382
Claims priority, application Germany Aug. 28, 1968
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11



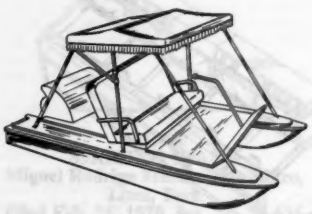
221,807
WEIGHTED FLOTATION WATER BARRIER END PANEL
Frank Meyers, Los Angeles County, Calif. (301 Via Monte D'Oro, Redondo Beach, Calif. 90277)
Filed Mar. 26, 1970, Ser. No. 22,246
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D71—1



221,808
BOAT
Terry J. Simpkins, Dublin, Ohio, assignor to AMF Incorporated
Filed May 4, 1970, Ser. No. 22,793
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



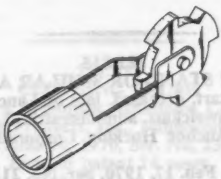
221,809
PADDLE WHEEL BOAT
Dale E. Love, Holland, Mich., assignor to Lovecraft Boat Company, Holland, Mich.
Filed May 20, 1970, Ser. No. 23,071
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



221,810
TRAFFIC SIGNAL
John M. Kiniry, Satellite Beach, Anthony Finazzo, Indian Harbor Beach., and John R. Carroll, Satellite Beach, Fla., assignors to Tri-Vec, Inc., Satellite Beach, Fla.
Continuation-in-part of design application Ser. No. 12,234, June 6, 1968. This application Aug. 11, 1969, Ser. No. 18,631
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D72—1

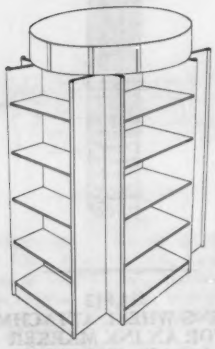
221,811
CANDLE
Wilfred L. Reiher, Sun City, Ariz., assignor to Candle World
Filed Sept. 23, 1968, Ser. No. 13,667
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D73—1

221,812
MARKING WHEEL ATTACHMENT FOR AN INK MARKER
John D. Locatelli, 4014 35th Ave. SW., Seattle, Wash. 98126
Filed May 15, 1970, Ser. No. 23,019
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—13

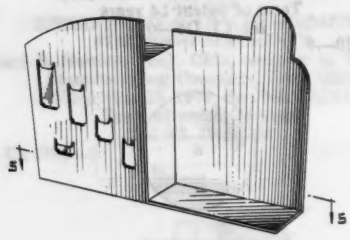


221,813
INVERTIBLE ROTATABLE DISPLAY STAND
Allan M. Patrick, 5990 Veronique St., Ville Brossard, Quebec, Canada
Filed Oct. 2, 1969, Ser. No. 19,376
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—9

221,814
MERCHANDISE DISPLAY STAND
William S. Leath, Birmingham, Ala., assignor to Ebsco Industries, Inc.
Original design application Feb. 24, 1969, Ser. No. 15,865. Divided and this application Oct. 17, 1969, Ser. No. 19,840
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D80—9

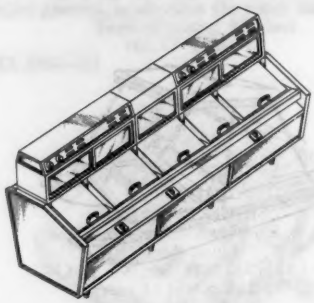


221,815
DISPLAY STAND OR SIMILAR ARTICLE
Jay F. Schweickart, deceased, late of Lancaster, Ohio, by Beverly J. Schweickart, administratrix, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Feb. 17, 1970, Ser. No. 21,464
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—9

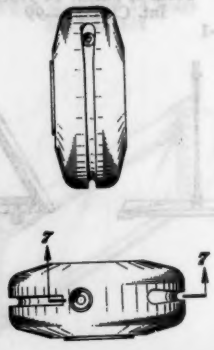


221,816
COOKING GRILL
Robert M. Bryan, Birmingham, Ala., assignor to Atlantic Stove Works, Inc.
Filed July 24, 1969, Ser. No. 18,391
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—10

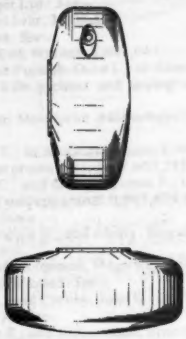
221,817
FISH FRYING RANGE
Dean Hutchison, Sacramento, Calif., assignor to Dean Industries, Ltd., Inglewood, Calif.
Filed Apr. 23, 1969, Ser. No. 16,861
Term of patent 7 years
Int. Cl. D7—*04*
U.S. Cl. D81—10



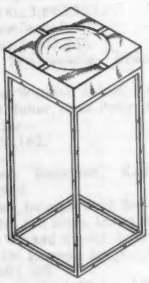
221,818
IMPLANTABLE MEDICAL-ELECTRONIC CIRCUITRY
William M. Chardack, Buffalo, N.Y., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Oct. 7, 1969, Ser. No. 19,444
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



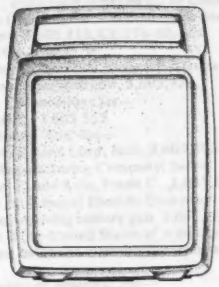
221,819
IMPLANTABLE MEDICAL-ELECTRONIC CIRCUITRY
William M. Chardack, Buffalo, N.Y., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Oct. 7, 1969, Ser. No. 19,448
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



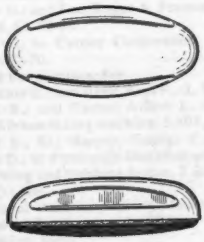
221,820
SMOKING STAND
Miguel Rodrigo Mazure, San Isidro, Lima, Peru
Filed Feb. 26, 1970, Ser. No. 21,636
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D85—2



221,821
CARRYING CASE
Donald Michael Genaro, Haworth, and Walter William Grote, Murray Hill, N.J., John Niel McGarvey, Drexel Hill, Pa., and Rembert Ryan Stokes, Middletown, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill and Berkeley Heights, N.J.
Filed Aug. 3, 1970, Ser. No. 24,270
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



221,822
CLOTHING BRUSH
Raymond Kleves, Winnipeg, Manitoba, Canada, assignor to Imperial Products, Inc., Minneapolis, Minn.
Filed June 26, 1970, Ser. No. 23,690
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D86—13



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF SEPTEMBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See—*
Collins, Paul F., 3,602,915.

Aach, Allyn J.; to Angelica Corporation. Adjustable apron. 3,602,916, Cl. 2-48.

Aambeeld, N.V.: *See—*
Mackay, Anthony J. R., 3,603,853.

AB Flygmal Air Targer Ltd.: *See—*
Sellman, Ulf Carl Iwar, 3,603,590.

AB Lyckeaborgs Bruk: *See—*
Lewin, Gunnar Erik Werner, 3,602,941.

Abboud, Harry I.; and Furnish, Oren C., to Kaiser Aluminum & Chemical Corporation. Kiln preheat and drying section. 3,603,569, Cl. 263-32.

Aberg, Sven Ulrik, to Molnlycke Akiebolaget. Diaper. 3,603,314, Cl. 128-284.

Abromaitis, Andre T., to McGraw-Edison Company. Pointer-dial arrangement for dual pressure gauge. 3,603,282, Cl. 116-129.

Abromavage, John C.; and George, James F., to Arcoa, Incorporated. Eye testing system and apparatus. 3,603,674, Cl. 351-37.

Absler, Howard K.: *See—*
Bortolotti, Lawrence R.; and Absler, Howard K.,3,603,681.

ABU Aktiebolag: *See—*
Nurmse, Karl; and Svensson, Hugo Ragnvald, 3,603,524.

ACF Industries, Incorporated: *See—*
Pietsch, Ervin I.; and Carney, John L., Jr., 3,603,439.

Ackermann, Ernest A.: *See—*
Curetti, Glauco E.; and Ackermann, Ernest A.,3,602,946.

Ackermann u. Schmitt K.G.: *See—*
Csaki, Joachim, 3,603,824.

Acushnet Company: *See—*
Reed, Bryant B., 3,602,934.

Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Method and system for generating tremolo effects in electronic musical instruments.,3,603,714, Cl. 84-1.25

Adams, John: *See—*
Manley, Brian William; Schagen, Pieter; and Adams, John,3,603,832.

Adams, Max M.; and Underwood, Donald L., to General Electric Company Gillette Company, The. Pulse storage and count-out device Electrically heated hair roller with self-contained power source. 3,603,940, Cl. 219-222.

Addressograph-Multigraph Corporation: *See—*
Maloney, William R.; and Hallquist, Arthur L., 3,603,585.

Adelphi Mobile Air Conditioners, Inc.: *See—*
Figa, Rubin, 3,603,105.

Adolff, J. F., Aktiengesellschaft: *See—*
Adolff, Jurgen Martin; Heintschel-Heinegg, Egbert; and Loskant, Winfried, 3,602,968.

Adolff, Jurgen Martin; Heintschel-Heinegg, Egbert; and Loskant, Winfried, to Adolff, J. F., Aktiengesellschaft. Method of space-treating fibers with reagents to change the dye affinity of the fibers. 3,602,968, Cl. 28-74.

Aerolite Electronics Corporation: *See—*
Schubert, Howard C., 3,603,947.

Agfa-Gevaert Aktiengesellschaft: *See—*
Engelsmann, Dieter, 3,603,236.
Kremp, Rudolf; Friedlaender, Ernst; and Winkler, Alfred, 3,603,228.
Kremp, Rudolf; and Winkler, Alfred, 3,603,233.
Wagner, Karl; and Huber, Hans-Peter, 3,603,230.

Agria-Werke, GmbH: *See—*
Gohler, Otto, 3,603,162.

Ahrens, Guenter: *See—*
Urbigkeit, Walter; Baumann, Karl P. G.; and Ahrens, Guenter,3,602,960.

Air Reduction Company, Incorporated: *See—*
Geiger, Lewis J., Jr.; and Estes, James W., 3,603,571.
Spradling, Joseph W.; and Kayser, John P., 3,603,308.

Akkumulatorenfabrik Dr. Leopole Jungfer, Firma: *See—*
Rabl, Richard, 3,603,188.

Albizati, Peter J.; Asin, Samson; Beers, Alfred B.; Child, Thomas A.; and Giangrande, Mario L., to Bard, C. R., Inc. Collapsible drainage bottle. 3,603,366, Cl. 150-0.5

Albright, Roy H.: *See—*
Foti, Arem; and Albright, Roy H.,3,603,721.

Alden, Milton, to Alden Research Foundation. Recorder drive means. 3,603,496, Cl. 226-117.

Alden Research Foundation: *See—*
Alden, Milton, 3,603,496.

Alexander, L Bruce, to Threadline Fastener Corporation, mesne. Installation tool for threaded insert. 3,603,180, Cl. 81-53.2

Alexeev, Jury Alexandrovich; Seliber, Boris Abelevich; and Usmanov, Vladimir Bakirovich. Light-contact photo-sensitive measuring instrument with scale range indicators. 3,603,877, Cl. 324-97.

Alfa-Laval Aktiebolag: *See—*
Finch, Nigel, 3,603,292.

Alibert, Vernon F.; and Carey, Thomas H., to Columbia Research Laboratories, Inc. Transducer for detecting pressure changes in fluid flow. 3,603,152, Cl. 73-398.

Allaud, Louis A., to Schlumberger Technology Corporation. Method and device to measure the speed of water in a polyphase flow. 3,603,795, Cl. 250-83.3

Allen, Charles H.; and Leach, Charles E., to United States of America, Atomic Energy Commission. Thulium oxide heat source and method for forming same. 3,603,415, Cl. 176-10.

Allen, Willis W.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,603,772.

Allied Chemicals Corporation: *See—*
Lohr, Thomas E., 3,603,555.

Allis, Louis, Company, The: *See—*
Crane, Harold E.; and Lord, Jack, 3,603,856.

Allis-Chalmers Manufacturing Company: *See—*
Patchen, Paul J.; and Kula, Frank C., 3,603,174.

Aloi, Anthony J., to General Electric Company. Firing mechanism for high rate of fire revolving battery gun. 3,603,201, Cl. 89-12.

Alterman, Robet B., to United States of America, Air Force. Push pull amplifier driven balanced transmission system. 3,603,733, Cl. 178-68.

Aluminum Company of America: *See—*
Heffner, Robert E., 3,602,980.

American Hospital Supply Corporation: *See—*
Becker, Fred R., III, 3,603,315.

American Optical Corporation: *See—*
Day, Christopher C.; and Holte, Bo, 3,603,811.

American Plasticraft Company: *See—*
Manetti, Fred P.; and Miller, George H., 3,603,914.

American Standard, Inc.: *See—*
Fichter, Barry S.; and Bell, Edward H., 3,603,336.

Ametek, Inc.: *See—*
Arce, Henry L., 3,603,167.
Horne, Edgar J.; and Spohn, Ralph C., 3,603,779.

AMF Incorporated: *See—*
Carnes, Roy W.; Marasso, Fred D.; and Rademacher, Robert E., 3,603,059.
Casson, Charles F., 3,603,817.
Perez, George R., 3,602,959.

AMP Incorporated: *See—*
Schumacher, William Ludlow, 3,603,910.

Anchor Hocking Corporation: *See—*
Bartholomew, Robert J., 3,603,436.

Anchor Post Products, Inc.: *See—*
Case, John S.; and Johnson, William B., 3,603,288.

Anderl, Peter; Roth, Johann; and Steibl, Theodor, to Niezoldi and Kramer GmbH. Motion picture camera. 3,603,678, Cl. 352-169.

Anderson, Arthur H.; and Fox, Roger A. Pressurizing device for mobile units. 3,603,238, Cl. 98-64.

Anderson, Carl M., to Carrier Corporation. Pressure relief valve. 3,603,333, Cl. 137-70.

Anderson Electric Corporation: *See—*
Eddens, Fletcher C.; and Reed, Karl F., II, 3,602,956.

Anderson, Frank R.; and Castro, Albert J., to Westates Space-Era Products, Inc. Ribbon-inking machine. 3,603,283, Cl. 118-6.

Anderson, Lloyd E., Sr.; Harper, George C.; Leber, William; and Miller, Charles G., to Pittsburgh-Des Moines Steel Company. Work mounted machining and finishing device. 3,603,204, Cl. 90-12.

Anderson, Tage O.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,603,976.

Angelica Corporation: *See—*
Aach, Allyn J., 3,602,916.

Angelo, Alfred, Inc.: *See—*
Piccione, Fred A., 3,602,919.

Angona, Frank A., to Mobil Oil Corporation. Method and apparatus for cavitational drilling utilizing periodically reduced hydrostatic pressure. 3,603,410, Cl. 175-65.

Ansell, Willie T.; and McConnell, James C., to Western Electric Company. Apparatus for sensing the orientation of flat article having a raised portion on one side thereof. 3,603,441, Cl. 193-43.

Antonio, Alexander G.: *See—*
Murchison, Jerre M.; and Antonio, Alexander G.,3,603,996.

A. O. Smith-Inland Inc.: *See—*
Jackman, Robert M.; and McDonald, William N., 3,603,182.

Apel, Konstantin, to Holzer-Patent AG. Device for controlling laundry driers with mechanical movement of the washing, in dependence upon the degree of drying. 3,603,805, Cl. 307-118.

Applied Technical Services, Inc.: *See—*
Hills, James F., 3,603,547.

Arbed, Acieries Reunies de Burback-Eich-Dudelange: *See—*
Glaesener, Ernest, 3,603,562.

Arblaster, Dennis. Throw-away condensate collector. 3,603,313, Cl. 128-275.

Arce, Henry L., to Ametek, Inc. Control device. 3,603,167, Cl. 74-388.

Archibald, Kenneth W. Sculptured bridge and sound post for stringed instruments. 3,603,193, Cl. 84-309.

Arcoa, Incorporated: *See—*
Abromavage, John C.; and George, James F., 3,603,674.

Arieh, Shimon; and Revillet, Georges, to Battelle Memorial Institute. Pressure responsive air discharge devices. 3,603,647, Cl. 302-29.

Arimura, Tohru; Kamata, Masamoto; Saito, Morio; and Okamoto, Terumi, to Nippon Kokan Kabushiki Kaisha. Computer control system for rolling metal strips using feed-forward and prediction. 3,603,124, Cl. 72-8.

Arimura, Yoshiaki, to Tokyo Shibaura Electric Co., Ltd. Position and direction detecting system using patterns. 3,603,728, Cl. 178-6.8

Arlasky, David F.; and Chapman, Robert W., to Chapman Performance Products, Inc. Adjustable vehicle stabilizing unit. 3,603,575, Cl. 267-34.

Armour, Donald F., to Monsanto Company. Compressible safety closure. 3,603,470, Cl. 215-9.

Arn. Kiekert Sohne, Firma: *See—*
Grass, Johann, 3,603,632.

Arnold, Gerald D.; and Arnold, John B., said Arnold, John B., assor. to said Arnold, Gerald D. Agricultural dehydrating and cooling system. 3,603,001, Cl. 34-136.

Arnold, John B.: *See—*
Arnold, Gerald D.; and Arnold, John B.,3,603,001.

Arnold, Loren Glenn; and Nelson, Richard Dale, to Deere & Company. Device for automatically landing a semi-integral moldboard plow. 3,603,405, Cl. 172-26.

Arnouat, Fernand R.: *See—*
Le Dorh, Maurice F.; Le Goffic, Yves H.; and Arnouat, Fernand R.,3,603,737.

Arpax Company, The: *See—*
Johnson, George R., 3,603,216.

Art Metal-Knoll Corporation: *See—*
Rothenberg, Murray; and Richardson, Donald A., 3,603,659.

Arvin Industries, Inc.: *See—*
Little, Robert E., 3,602,988.

Asahi Kogaku Kogy Kabushiki Kaisha: *See—*
Nobusawa, Tsukumo, 3,603,799.

Ash, Bernard Edwin, to International Standard Electric Corporation. Acceleration control of machines. 3,603,842, Cl. 317-5.

Asher, Frances E.: *See—*
Asher, Robert G.; and Asher, Frances E.,3,603,022.

Asher, Robert G.; and Asher, Frances E. Insect and rodent band. 3,603,022, Cl. 43-131.

Ashford, Ernest S.: *See—*
Dilger, Lawrence; and Ashford, Ernest S.,3,603,481.

Asin, Samson: *See—*
Albizati, Peter J.; Asin, Samson; Beers, Alfred B.; Child, Thomas A.; and Giangrande, Mario L.,3,603,366.

Assmus, Friedrich: *See—*
Wolber, Robert; and Assmus, Friedrich,3,603,075.

Associated Electrical Industries Limited: *See—*
Powers, Patrick, 3,603,787.

Atkins, Barry: *See—*
Elsworth, John F.; Atkins, Barry; and Sever, Bernard P.,3,603,251.

Atlantic Richfield Company: *See—*
Braun, Philip H., 3,603,396.

Attermeyer, Lawrence A., to Cincinnati Milling Machine Co., The. Anti-backlash coupling. 3,603,624, Cl. 287-109.

Attwood, Dennis P.; Syme, David M.; and Tuffill, Harold W., to International Business Machines Corporation. Micro programmed data processing system. 3,603,936, Cl. 340-172.5

Atwood, Hyatt B.; and McLean, James N., to Herr Manufacturing Company, Inc. Leakage-preventing construction for spinning rings. 3,603,070, Cl. 57-120.

Aucktor, Erich; and Willimek, Walter, to Lohr & Bromkamp GmbH. Constant velocity joint. 3,603,111, Cl. 64-21.

August, Paul. Mixer in particular a building material mixer in which a rapidly rotating worm screw is mounted in a trough. 3,603,566, Cl. 259-178.

Automated Building Components, Inc.: *See—*
Jureit, John Calvin; and Csakvary, Oscar, 3,603,244.

Automation Products, Inc.: *See—*
Banks, William B., 3,603,137.

Autoscan, Inc.: *See—*
Pelta, Edmond R., 3,603,872.
Pelta, Edmond R.; and Gold, Kenneth Stewart, 3,603,879.

Avco Corporation: *See—*
Webb, George, 3,603,259.

Avella, Guy. Hair treating device. 3,603,323, Cl. 132-131.

Averitt, Marnie C. Stored energy shear device. 3,602,989, Cl. 30-261.

Babcock & Wilcox Company, The: *See—*
Warren, Holland D., 3,603,793.

Badgett, Charles E.; and Osmalov, Jerome S., to Morris, Philip, Incorporated. Flavor-releasing smoking article and method of making the same. 3,603,319, Cl. 131-10.9

Badische Maschinenfabrik G.m.b.H.: *See—*
Van Dorst, Cornelius, 3,603,587.

Badum, Paul J.; and Nejezchleb, Vladimir, to International Business Machines Corporation. Pneumatic record processing system. 3,603,943, Cl. 340-174.1

Bailey, Christopher E. G.; and Catherall, Reginald, to Solartron Electronic Group Limited, The. Successive approximation analog-to digital converters. 3,603,970, Cl. 340-347.

Baker, Alfred Dickens, to Lucas, Joseph, (Industries) Limited. Headlamp adjusting systems. 3,603,785, Cl. 240-61.1

Baker, Edwin E. Animal marking device. 3,603,291, Cl. 119-1.

Baker Oil Tools, Inc.: *See—*
Kammerer, Archer W., Jr.; and Johnson, Gary R., 3,603,412.

Balazer, Leonard P.: *See—*
Freier, Michael; and Balazer, Leonard P.,3,604,003.

BALCO Filtertechnik GmbH: *See—*
Heinrich, Hans Joachim, 3,602,991.

Ball, Charles W.; and Brodsky, Alexander, said Brodsky assor to Turico, Richard. Combined sprayer and wiper device. 3,603,692, Cl. 401-139.

Ban, Itsuki. Apparatus for shifting magnetic head in multi- track tape player. 3,603,164, Cl. 74-54.

Ban, Itsuki. Tape cartridge positioning apparatus. 3,603,743, Cl. 179-100.2

Banas, Edmund O., to Du Pont de Nemours, E. I., and Company. Method and apparatus for extracting heat from articles with a liquid freezant. 3,603,102, Cl. 62-64.

Bang, Mogens W., to Stackpole Carbon Company. Variable resistor with tilted contact. 3,603,854, Cl. 338-183.

Bang, Mogens W., to Stackpole Carbon Company. Linear motion variable resistor with bridgeing contact in slide. 3,603,855, Cl. 338-183.

Banks, William B., to Automation Products, Inc. Vibrating method and apparatus for determining the physical properties of material. 3,603,137, Cl. 73-32.

Barbeau, Raymond A.; and Wroblewski, Edward J., to International Business Machines Corporation. Magnetic recording tape cleaner. 3,602,940, Cl. 15-308.

Barber, Franklin D., to Standard Car Truck Company. Railway car center bearing. 3,603,265, Cl. 105-199.

Barber-Colman Company: *See—*
Clements, Ralph E., 3,603,843.

Bard, C. R., Inc.: *See—*
Albizati, Peter J.; Asin, Samson; Beers, Alfred B.; Child, Thomas A.; and Giangrande, Mario L., 3,603,366.

Bareiss, David A., to Combustion Engineering, Inc. Package for large glass panels. 3,603,455, Cl. 206-62.

Barlett, Norman, 50% to Bartlett, Marjorie. Passenger participation amusement ride. 3,603,583, Cl. 272-36.

Barltrop, Richard Kenneth, to Elliott Brothers (London) Limited. Synchronised power control. 3,603,534, Cl. 244-78.

Barron, Daniel. Radar propagation ray plotter. 3,602,995, Cl. 33-1.

Bart, Philip D.; and Waznys, Peter J., to Remco Industries, Inc. Jumping toy. 3,603,030, Cl. 46-120.

Bartholomew, Charles A.; and Easton, Roger L., to United States of America, Navy. Spectrographic I.F. preselector. 3,603,885, Cl. 325-432.

Bartholomew, Charles A.: *See—*
Easton, Roger L.; Bartholomew, Charles A.; and Rovinski, Robert S.,3,603,530.

Bartholomew, Robert J., to Anchor Hocking Corporation. One-position clutch. 3,603,436, Cl. 192-46.

Bartlett, Marjorie: *See—*
Barlett, Norman, 3,603,583.

Barton, Edward D., to Xerox Corporation. Ultrasonic paper detection. 3,603,680, Cl. 355-3.

Barton, Robert Hall; Brown, Martin Luther; and Mitchell, Andrew, to Du Pont de Nemours, E. I., and Company. Multilayered structure. 3,603,221, Cl. 94-9.

Basiulis, Algerd: *See—*
Paine, Thomas O., Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Buzzard, Robert J.; and Basiulis, Algerd,3,603,382.

Bastide, Paul. Device for controlling the amount of light rays in optical instruments. 3,603,672, Cl. 350-315.

Bata Shoe Company of Canada Limited: *See—*
Schilke, Waldemar, 3,603,120.

Battelle Memorial Institute: *See—*
Arieh, Shimon; and Revillet, Georges, 3,603,647.
Cuenoud, Gerard, 3,603,867.

Baugh, Benton F.: *See—*
Nelson, Bobby H.; and Baugh, Benton F.,3,603,401.

Baumann, Karl P. G.: *See—*
Urbigkeit, Walter; Baumann, Karl P. G.; and Ahrens, Guenter,3,602,960.

Baxter Laboratories, Inc.: *See—*
Seitz, Lamont J., 3,603,969.

Baynes, William R.: *See—*
Staats, William A.; and Baynes, William R.,3,603,861.

Becker, Fred R., III, to American Hospital Supply Corporation. Surgical face mask. 3,603,315, Cl. 128-146.2

Beeker, Charles W.: *See—*
White, Stanley M.; and Beeker, Charles W.,3,603,257.

Beerens, Marinus. Purse comprising a sorting member. 3,603,325, Cl. 133-3.

Beers, Alfred B.: *See—*
Albizati, Peter J.; Asin, Samson; Beers, Alfred B.; Child, Thomas A.; and Giangrande, Mario L.,3,603,366.

Beers, Howard L., to Wescom, Inc., mesne. Expandible enclosure for printed circuit cards and the like. 3,603,845, Cl. 317-117.

Behnke, Marvin C., to Hughes Aircraft Company. Millimeter wave scanning lens antenna. 3,604,009, Cl. 343-754.

Behrens, C., Aktiengesellschaft: *See—*
Bredow, Walter, 3,603,187.

Beier, Walo. Anti-theft device for motor vehicles. 3,603,750, Cl. 200-44.

Bell & Howell Company: *See—*
Da Prato, Leo J., 3,603,789.
Haake, Robert, 3,603,597.
Prelletz, Edward R.; and Rucinski, Roland R., 3,603,527.

Bell, Edward H.: *See—*
Fichter, Barry S.; and Bell, Edward H.,3,603,336.

Bell Telephone Laboratories, Incorporated: *See—*
Bobeck, Andrew H.; Scovil, Henry E. D.; and Thiele, Alfred A., 3,603,939.
Cutler, Cassius Chapin, 3,603,725.
Edson, James O., 3,603,739.
Gyorgy, Ernst M.; Jaeger, Raymond E.; and Seidel, Harold, 3,603,899.
Heick, Robert B.; and Mann, Henry, 3,603,746.
Kerr, Douglas A.; and Kolodner, Bernard B., 3,603,932.
Logan, Ralph Andre; Rosenzweig, Walter; and Wiegman, William, 3,603,833.
Mann, Henry, 3,603,745.
White, Gerard, 3,603,818.

Belue, Fred M., to Gilbert & Barker Manufacturing Company. Automatic trip safety fill nozzle. 3,603,359, Cl. 141-208.

Bendix Corporation, The: *See—*
Brooks, Peter, 3,603,173.
Cripe, Maxwell L., 3,603,558.
Hartford, Thomas W., 3,603,950.
Hughes, Harold W.; and Stone, Samuel E., 3,603,925.
Kimura, Jack A., 3,603,926.
Kosakowski, Henry, 3,603,979.
Kytta, Oswald O., 3,603,208.
Mac Duff, Stanley I.; and Lewis, Richard L., 3,603,209.
Medlinski, William W., 3,603,948.
Nelson, Ralph M., 3,603,582.
Reznicek, Raymond A.; Kretchman, Gerald L.; and Stone, Samuel E., 3,603,648.
Spencer, Glenn S., 3,603,437.
Van Winkle, Edgar W.; Kosakowski, Henry R.; and Hollinger, Walter P., 3,603,980.

Bengesser, Karl; and Garbislander, Karl. Clamp coupling. 3,603,619, Cl. 285-45.

Bennett, Leonard Myer; and Cropps, John Edwin, to Schutte and Koerting Company. Electromagnetic flowmeters. 3,603,146, Cl. 73-194.

Bensen, Carl Erling, to Nordisk Ventilator Co., A/S. Axial flow fan wheel. 3,603,698, Cl. 416-157.

Benvenuti, Lamberto: *See—*
Turini, Francesco, 3,603,116.

Benz & Hilgers GmbH: *See—*
Kuster, Josef; and Broll, Josef, 3,603,479.

Bergeson, Richard P., to Maytag Company, The. Latch for dishwasher door. 3,603,658, Cl. 312-319.

Bergische Achsenfabrik Fr. Kotz & Sohne: *See—*
Brandt, Heinrich Peter, 3,603,420.

Bergman, Charles T.: *See—*
Buchholz, Arnold R.; and Bergman, Charles T.,3,603,327.

Berly, Marcel, to H. Ernault-Souma. Correction device for machine-tools. 3,603,184, Cl. 82-14.

Bernstein, Allen; and Miller, Stephen N., to Raytheon Company. Radar frequency spectrum control circuit. 3,603,991, Cl. 343-5.

Bertioli, Michael Murray; and Willington, David Everitt, to Lucas, Joseph, (Industries) Limited. Method of manufacturing semi-conductor circuits. 3,602,983, Cl. 29-577.

Bess, Roscoe M., to Illinois Cereal Mills, Inc. Degerminator. 3,603,365, Cl. 146-279.

Best, John H., & Sons, Inc.: *See—*
Best, Leon H., 3,603,461.

Best, Leon H., to Best, John H., & Sons, Inc. Rug rack. 3,603,461, Cl. 211-47.

Best Lock Corporation: *See—*
Best, Walter E., 3,603,123.

Best, Walter E., to Best Lock Corporation. Pin tumbler lock. 3,603,123, Cl. 70-364.

Bevan, Robert K.: *See—*
Schwartz, Leonard; and Bevan, Robert K.,3,604,010.

Biedermann, Siegfried, to Uninorm Anstalt. Apparatus for the transmission of information. 3,603,933, Cl. 340-172.5

Bielfeldt, Friedrich Bernd, to Eckert & Ziegler GmbH. Injection molding machine. 3,602,950, Cl. 18-125.

Billett, Ronald J.; Chamberlin, Donald W.; and McGee, Arthur L., to FMC Corporation. Apparatus for deeding veneer to plywood assembly station. 3,603,463, Cl. 214-8.5

Billinger, Brian Arthur; MacNamara, Francis Peter; and Cooper, George Samuel, to Rolls-Royce Limited. Thrust reverser for fan type jet propulsion engines. 3,603,090, Cl. 60-226.

Billstein, August, Firma: *See—*
Hahn, Erich, 3,603,576.

Bio Data, Inc.: *See—*
Malcolm, Donald H., 3,603,769.

Bird, Melvin R., to General Motors Corporation. Ball bearing self-aligning seat. 3,603,654, Cl. 308-35.

Bischler, Paul. Instrument for producing breathing action on the lungs. 3,603,307, Cl. 128-145.6

Bisschop, Jean-Marie. Display holder for goods. 3,603,456, Cl. 206-78.

Bissell Inc.: *See—*
Druart, Richard F.; and Herrick, Wallace D., 3,602,933.
Morris, William; and Rosendall, Henry J., 3,602,932.

Bissett-Berman Corporation, The: *See—*
Brecker, Nicholas L., Jr.; and Murphy, John B., 3,603,880.

Black and Decker Manufacturing Company, The: *See—*
Weber, Edwin J., 3,603,065.

Black Clawson Company, The: *See—*
Maxey, Carl W.; and Cage, Kenneth M., 3,603,446.

Black, Kendrick E.: *See—*
Howard, Sam B.; and Black, Kendrick E.,3,603,502.

Bliss, George N., to Diamond International Corporation. Apparatus for the detection and removal of selected foreign matter from a material. 3,603,458, Cl. 209-111.6

Bloedel, Mac Millan Limited: *See—*
Neild, Peter J., 3,603,362.

Blomeyer, Walter; and Saul, Peter, to Vickers-Zimmer Aktiengesellschaft Planung und Bau von Industrieanlagen. Metallic rubbing-ring seal for rotatable-shaft passageways in apparatus which, during use, contain liquid media. 3,603,601, Cl. 277-83.

Blood, Ernest R.; and Ohms, Edward J., to Caterpillar Tractor Company. Auxiliary emergency steering for articulated vehicles. 3,603,424, Cl. 180-79.2

Bloom, Joseph Lewis, to Lucas, Joseph, (Industries) Limited. Speed control for gas turbine engines. 3,603,160, Cl. 73-541.

Bobeck, Andrew H.; Scovil, Henry E. D.; and Thiele, Alfred A., to Bell Telephone Laboratories, Incorporated. Magnetic domain propagation arrangement. 3,603,939, Cl. 340-174.

Bodenseewerk Geratetechnik GmbH: *See—*
Schwarz, Karlhans, 3,603,161.

Boettcher, Stephen A., to Speedfam Corporation. Polishing machine. 3,603,042, Cl. 51-131.

Boniface, Roy, to Moy, Ernest F., Limited. Tilt table device. 3,603,545, Cl. 248-184.

Bonin, Richard J., Jr., to Under Sea Industries, Inc. Snorkel. 3,603,306, Cl. 128-145.

Borg-Warner Corporation: *See—*
Opal, Kenneth E., 3,603,866.

Borkowski, Casimer J.; and Kopp, Manfred K., to United States of America, Atomic Energy Commission Space Administration. Two-dimensional position-sensitive radiation detector. 3,603,797, Cl. 250-83.6

Bortolotti, Lawrence R.; and Absler, Howard K., to Uarco Incorporated. Method of reproducing predetermined images. 3,603,681, Cl. 355-17.

Bosch, Robert, Photokino GmbH: *See—*
Loewe, Richard, 3,603,676.

Botefuhr, Harold R., to Murphy, G. W., Industries, Inc. Radial arm saw. 3,603,360, Cl. 143-6.

Botnick, Irlin H. Push botton operated valve. 3,603,349, Cl. 137-636.1

Bottoms, Harry Simister, to Lucas, Joseph, (Industries) Limited. Level control arrangements for fuel tanks. 3,603,342, Cl. 137-414.

Bottos, Helen P. Iron support for attachment to an ironing board. 3,603,543, Cl. 248-117.6

Bowcott, Roy Price, to Lucas, Joseph, (Industries) Limited. Electric starter motors. 3,603,803, Cl. 290-38.

Bracken, Pat O.; and Lane, George H., to Montech Incorporated. Storm warning system. 3,603,951, Cl. 340-224.

Brandt Automatic Cashier Co.: *See—*
Buchholz, Arnold R.; and Bergman, Charles T., 3,603,327.

Brandt, Heinrich Peter, to Kotz, Fritz, and Kotz, Christian Peter, d/b/a Bergische Achsenfabrik Fr. Kotz & Sohne. Hydrostatic wheel-hub drive mechanism primarily for vehicles not tied to rails. 3,603,420, Cl. 180-66.

Brashear, Buddy Joe; Stapleton, Donald Max; and Eskeli, Michael, to Rotating circular wing. Liquid agitator Rotating circular wing. 3,603,699, Cl. 416-180.

Braun, Philip H., to Atlantic Richfield Company. Method for increasing subterranean formation permeability. 3,603,396, Cl. 166-261.

Brecker, Nicholas L., Jr.; and Murphy, John B., to Bissett-Berman Corporation, The. Service computer for indicating when a product such as an automobile has to be serviced. 3,603,880, Cl. 324-182.

Bredow, Walter, to Behrens, C., Aktiengesellschaft. Workpiece clamps for coordinate tables of turret punch. 3,603,187, Cl. 83-62.

Breed, David S. Liquid annular orifice dashpot timer with modified liquid. 3,603,072, Cl. 58-1.

Brenner, William C. Golf club protector. 3,603,368, Cl. 150-52.

Briana Anthony, M.; Crain, Arthur; Hatcher, Burrell R.; and Sheldon, Edward J., to Raytheon Company. Antenna testing apparatus and method. 3,604,000, Cl. 343-17.7

Bricker, Gene D.: *See—*
Sheridan, John J.; Bricker, Gene D.; and Wigner, Donald F.,3,603,825.

Brilando, Frank P.; and Jameson, Stanley R., to Schwinn Bicycle Company. Universal support for front basket for bicycles. 3,603,549, Cl. 248-230.

Britt, Ronald H., to Plessey Company Limited, The. Optical character recognition system including scanned diode matrix. 3,603,930, Cl. 340-146.3

Britt, Ronald H.; and Matthews, Peter C., to Plessey Company Limited, The. Optical character recognition system including a matrix of scanned photosensitive elements. 3,603,931, Cl. 340-146.3

Britton, C.E., and J.P., Limited: *See—*
Campbell, Peter I., 3,603,604.

Brodsky, Alexander: *See—*
Ball, Charles W.; and Brodsky, Alexander,3,603,692.

Broll, Josef: *See—*
Kuster, Josef; and Broll, Josef,3,603,479.

Brookes, Neil R.: *See—*
Sneeden, Ralph J.; Brookes, Neil R.; and Watts, Hargus,,3,603,082.

Brooks, Peter, to Bendix Corporation, The. Center core for a laminated coupling. 3,603,173, Cl. 74-581.

Broughton, Arthur E., to Broughton Corporation. Automatic lavatory system for sewage disposal pumping unit. 3,602,922, Cl. 4-100.

Broughton Corporation: *See—*
Broughton, Arthur E., 3,602,922.

Brouwer, Jerome J.; Church, Gerald C.; and Morris, Tom C., to Texas Instruments, Incorporated. Electronic resolved sweep signal generator. 3,603,997, Cl. 343-10.

Brown & Root, Inc.: *See—*
Lochridge, Joe C., 3,603,617.

Brown & Sharpe Manufacturing Company: *See—*
Hirt, Alfred, 3,603,346.

Brown, David Scatcherd, to Parsons, Howard Gaubb, Sir and Company Limited. Astronomical telescopes. 3,603,671, Cl. 350-310.

Brown Engineering Company, Inc.: *See—*
White, Robert B.; and Cooke, Charles L., 3,603,329.

Brown, Jerry A.; and Schroer, Charles E., to Hamilton Cosco, Inc. Paper dispenser. 3,603,519, Cl. 242-55.3

Brown, Martin Luther: *See—*
Barton, Robert Hall; Brown, Martin Luther; and Mitchell, Andrew,3,603,221.

Brucken, Byron L.; and Whyte, Ronal H., to General Motors Corporation. Plastic tub assembly for use with clothes washer. 3,603,118, Cl. 68-23.

Brucker-Steinkuhl, Kurt. Method and apparatus for spatial proportional navigation. 3,603,531, Cl. 244-3.16

Brunk, David H.: *See—*
Galloway, Richard T.; and Brunk, David H.,3,603,775.

Buchholz, Arnold R.; and Bergman, Charles T., to Brandt Automatic Cashier Co. Jam eliminator apparatus for coin counting machines. 3,603,327, Cl. 133-8.

Buck, Herman R., to M-B-W., Inc. Portable tamping machine. 3,603,225, Cl. 94-49.

Buckley, Bruce S.: *See—*
Kast, Howard B.; and Buckley, Bruce S.,3,603,338.

Buell, Lewis W.: *See—*
Cook, Lloyd A.; and Buell, Lewis W.,3,603,498.

Buitoni Foods Corporation: *See—*
Tangel, Frank P., 3,603,270.

Bundschuh, John J., to Eastman Kodak Company. Adjustable spindle arm for cartridge-loading motion picture projector. 3,603,529, Cl. 242-197.

Bunker-Ramo Corporation, The: *See—*
Burnham, Francis L., 3,603,883.
Gregg, Roland S., Jr.; and Hoegeman, Herman F., Jr., 3,603,966.
Ireland, John W.; and Holloway, James C., 3,603,768.
Podraza, George V., 3,603,816.

Burger, William H., to Kimberly-Clark Corporation. Apparatus for forming a nonwoven web of criss-cross threads. 3,602,965, Cl. 28-1.

Burke, Richard J.; and Lissaman, Peter B. S. Induced air displacement control of flying objects. 3,603,537, Cl. 244-155.

Burkland, Charles W., to Maytag Company, The. Appliance drive system. 3,603,121, Cl. 68-23.4

Burkland, Curtis V., to CCI Aerospace Corporation. Dual fluid Rankine cycle powerplant. 3,603,087, Cl. 60-64.

Burnham, Francis L., to Bunker-Ramo Corporation, The. Pulse separation circuit. 3,603,883, Cl. 325-324.

Burrough, Donald E.; and Leinhauser, Joe Paul, to Deere & Company. Header control for a harvester. 3,603,066, Cl. 56-208.

Burroughs Corporation: *See—*
Somlyody, Arpad, 3,603,965.

Burrows, Robert C. Variable drive ratio engine to transmission adapter. 3,603,177, Cl. 74-745.

Burtest Products Corporation: *See—*
Cohen, Jerome Herbert, 3,603,011.

Bury, Joe. Apparatus for playing a game utilizing the perception of television commercials. 3,603,592, Cl. 273-135.

Buyer, Edward M. Dual frequency radio apparatus for data transmission and direction finding. 3,604,004, Cl. 343-113.

Buzzard, Robert J.: *See—*
Paine, Thomas O., Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Buzzard, Robert J.; and Basiulis, Algerd,3,603,382.

Buzzard, Wallace C.; and Krysiak, Joseph E. Air cooled disc brake rotor. 3,603,435, Cl. 188-218.

Byerley, Darrel D.; and Fisher, Robert B., to Tinker and Rasor. Cathodic protection monitor. 3,603,956, Cl. 340-249.

Bykov, Vladimir Alexandrovich: *See—*
Khimich, Georgy Lukich; Niskovskikh, Vitaly Maximovich; Varaxin, Alexei Ivanovich; Gelfenbein, Evgeny Jukhimovich; and Bykov, Vladimir Alexandrovich,3,603,377.

Byrd, Clarence D., to Miller, Lacy J., Machine Company, Inc. Quick release support. 3,603,550, Cl. 248-313.

Cage, Kenneth M.: *See—*
Maxey, Carl W.; and Cage, Kenneth M.,3,603,446.

Callahan, John F.: *See—*
Winston, William D., Jr.; and Callahan, John F.,3,603,294.

Callaway, A. S.: *See—*
McCrocklin, James W., 3,603,080.
McCrocklin, James W., 3,603,081.

Cambridge, Ronan Malcolm, to Northern Electric Company Limited. Method and means for ringing a telephone sub-set. 3,603,740, Cl. 179-84.

Camco, Incorporated: *See—*
Current, James H; Ehlert, Harry C.; and Kilgore, Marion D., 3,603,388.
Terral, Ben D.; and Hardy, Henry W., Jr., 3,603,393.

Camenzind, Hans Rudolph; Grebene, Alan Bebin; and Kleitman, David, to Signetics Corporation. Amplitude demodulator using a phase locked loop. 3,603,890, Cl. 329-101.

Campbell, Albert E., to Chevron Research Company. Well liner. 3,603,389, Cl. 166-171.

Campbell, Clarence R.: *See—*
Chamberlain, Leon A.; Campbell, Clarence R.; and Stokes, Leif T.,3,603,450.

Campbell, David D., to General Motors Corporation. Vehicle cruise control servomotor. 3,603,425, Cl. 180-108.

Campbell, Peter I., to Britton, C.E., and J.P., Limited. Pipe fitting. 3,603,604, Cl. 277-209.

Canada, Minister of National Defense: *See—*
Woodhead, Robert C., 3,603,734.

Canale, Raymond P., to Holley Carburetor Company. Hydraulic resistor. 3,603,332, Cl. 137-56.

Cannalte, Gary A.: *See—*
Zaura, Paul J., Jr; Hawkins, George C.; and Cannalte, Gary A.,3,603,884.

Carborundum Company, The: *See—*
Mann, Freeman M., Jr.; and Carpenter, James H., Jr., 3,603,037.

Cardwell Manufacturing Company, Inc.: *See—*
Fandetti, Matthew R., 3,603,169.

Carella, Richard F.; and Johnson, James J., to General Motors Corporation. Mounting arrangement for a vehicle body roof panel. 3,603,636, Cl. 296-137.

Carey, Thomas H.: *See—*
Alibert, Vernon F.; and Carey, Thomas H.,3,603,152.

Carlson, Reuben C., to Standard Kollsman Industries Inc. Variable output voltage selector. 3,603,870, Cl. 323-74.

Carlstein, Joseph, to Vernitron Corporation. Digital pulse rate generator. 3,603,773, Cl. 235-154.

Carnes, Roy W.; Marasso, Fred D.; and Rademacher, Robert E., to AMF Incorporated. Universal bagger. 3,603,059, Cl. 53-258.

Carney, John L., Jr.: *See—*
Pietsch, Ervin I.; and Carney, John L., Jr.,3,603,439.

Carpenter, James H., Jr.: *See—*
Mann, Freeman M., Jr.; and Carpenter, James H., Jr.,3,603,037.

Carpentier, Frank J.; and Lins, Stanley J., to Sperry Rand Corporation. Snap action switch. 3,603,756, Cl. 200-159.

Carrier Corporation: *See—*
Anderson, Carl M., 3,603,333.
Gable, Gerald K., 3,603,104.
Hitzke, Milton H., 3,603,806.
Jensen, Richard C., 3,603,702.
Leonard, Louis H., Jr., 3,603,379.

Case, John S.; and Johnson, William B., to Anchor Post Products, Inc. Apparatus for continuous coating of metallic products with fusible pulverulent materials. 3,603,288, Cl. 118-620.

Casey, Jesse Marion, 1/10 each to Collins, A. Carl, Dr. Dawson, McGinty, and Livingston. Wave operated power apparatus. 3,603,804, Cl. 290-42.

Caspers, James W., to United States of America, Navy. Two-stage radar system. 3,603,989, Cl. 343-5.

Casson, Charles F., to AMF Incorporated. Solid state alternating current switch means for selective energization of parallel loads. 3,603,817, Cl. 307-252.

Castello, Leo J. Method of sweater fabrication. 3,602,914, Cl. 2-90.

Castle, Carl H.: *See—*
Reed, Wallace L.; Reed, James L.; Redden, Charles T.; and Castle, Carl H.,3,603,036.

Castro, Albert J.: *See—*
Anderson, Frank R.; and Castro, Albert J.,3,603,283.

Caterpillar Tractor Company: *See—*
Blood, Ernest R.; and Ohms, Edward J., 3,603,424.
Stratton, Michael K., 3,603,618.

Catherall, Reginald: *See—*
Bailey, Christopher E. G.; and Catherall, Reginald,3,603,970.

Caunter, Jeffrey Malcolm; and Higham, Peter, to Perkin-Elmer Limited. Nuclear magnetic resonance probe. 3,603,871, Cl. 324-0.5

C.A.V. Limited: *See—*
Chandraratna, Harin, 3,603,705.

CCI Aerospace Corporation: *See—*
Burkland, Curtis V., 3,603,087.
Cecchin, Gildo; and Hilbert, Francis H., to Motorola, Inc. Stacked differential amplifiers. 3,603,894, Cl. 330-30.
Centre d'Etude de Energie Nuclearie C.E.H.:*See—*
Huet, Jean-Jacques Henri Oscar; and Massaux, Henry Berthe Marie Joseph, 3,602,977.
Cerberus AG: *See—*
Walthard, Beat, 3,603,949.
Cermak, Antonin; Michalek, Slavomir; and Strait, Zdenek, to Ceskoslovenska akademie ved. Electromagnetic micropump for processing aggressive liquid substances. 3,603,706, Cl. 417-417.
Cervotec Developments Limited: *See—*
Cowley, John James, 3,603,100.
Ceskoslovenska akademie ved: *See—*
Cermak, Antonin; Michalek, Slavomir; and Strait, Zdenek, 3,603,706.
Chamberlain, Leon A.; Campbell, Clarence R.; and Stokes, Leif T., to Envirotech Corporation. Enclosed belt conveyor. 3,603,450, Cl. 198-198.
Chamberlin, Donald W.: *See—*
Billett, Ronald J.; Chamberlin, Donald W.; and McGee, Arthur L.,3,603,463.
Champion Spark Plug Company: *See—*
Eaton, Carl J., 3,603,835.
Chandraratna, Harin, to C.A.V. Limited. Check valves. 3,603,705, Cl. 417-253.
Chang, Robert S. Elastic hook band. 3,602,957, Cl. 24-16.
Channon, Robert M. Floating saucer chair. 3,602,930, Cl. 9-347.
Chapman Performance Products, Inc.: *See—*
Arlasky, David F.; and Chapman, Robert W., 3,603,575.
Chapman, Robert W.: *See—*
Arlasky, David F.; and Chapman, Robert W.,3,603,575.
Charlap, E. Paul: *See—*
Charlap, Morris I.; and Picker, Edwin H., 3,603,673.
Charlap, Morris I.; and Picker, Edwin H., to Charlap, E. Paul. Method of inserting music and lyrics into a dramatic motion picture. 3,603,673, Cl. 352-5.
Chase, Robert F.; and Sherman, Ralph R., Jr., to General Electric Company. Battery charging circuit with locking and resetting means. 3,603,862, Cl. 320-39.
Chase, Robert L., to United States of America, Atomic Energy Commission. Segmented gamma ray detector amplifier. 3,603,796, Cl. 250-83.3
Chase-Shawmut Company, The: *See—*
Salzer, Erwin, 3,603,909.
Check, Mathias M. Automatic dead-locking latch bolt for a rim lock. 3,603,630, Cl. 292-169.15
Chenault, Roger; Portal, Guy; Porrot, Emile; and Prigent, Raymond, to Commissariat a l'Energie Atomique. Method and device for reading thermoluminescent dosimeters. 3,603,791, Cl. 250-71.5
Chengges, James L.; and Hart, Benjamin F., to General Electric Company. High speed sorting device. 3,603,444, Cl. 198-24.
Chevron Research Company: *See—*
Campbell, Albert E., 3,603,389.
Hutchinson, Stanley O.; and McKinnell, John C., 3,603,398.
Reed, Marion G., 3,603,399.
Chew, Kenneth. I Ching fortune-telling game. 3,603,593, Cl. 273-161.
Chicago Etching Corporation: *See—*
Schomburg, Walter A., 3,603,014.
Child, Thomas A.: *See—*
Albizati, Peter J.; Asin, Samson; Beers, Alfred B.; Child, Thomas A.; and Giangrande, Mario L.,3,603,366.
Christal, Philip Richard, to Molins Machine Company, Limited, The. Positioning and securing of workpieces for machining operations. 3,603,581, Cl. 269-307.
Christensen Diamond Products Company: *See—*
Grill, Werner K.; and Link, Howard D., 3,603,413.
Link, Howard D., 3,603,411.
Christensen, John W.: *See—*
Goldmark, Peter C.; and Christensen, John W.,3,603,665.
Christy, Daniel LaMar: *See—*
Christy, Daniel LaMar; and Parker, Lawrence E., 3,603,287.
Christy, Daniel LaMar; and Parker, Lawrence E., to Christy, Daniel LaMar. Apparatus for coating elongated articles. 3,603,287, Cl. 118-309.
Christy, J. Raymond, Enterprises, Inc.: *See—*
Kay, Charles, 3,603,060.
Chromalloy American Corporation: *See—*
Morris, Charles William; and Ulyate, John Raymond, 3,603,155.
Chua, Leon O., to Purdue Research Foundation. Linear active network device for transforming one class of nonlinear devices into another. 3,603,903, Cl. 333-80.
Chudakov, Vyacheslav Andreevich: *See—*
Khrenov, Konstantin Konstantinovich; Chudakov, Vyacheslav Andreevich; Strogenov, Konstantin Vasilievich; Kleiman, Vladimir Leonidovich; Fishkis, Mikhail Mironovich; Nikolaev, Vyacheslav Mikhailovich; Kalnishevsky, Vladimir Konmunarovich; and Maltsev, Boris Mikhailovich,3,603,760.
Church, Gerald C.: *See—*
Brouwer, Jerome J.; Church, Gerald C.; and Morris, Tom C.,3,603,997.
Ciba Limited: *See—*
Mast, Fred, 3,603,794.
Cie: *See—*
Frohlich, Jacques, 3,603,493.
Cincinnati Milling Machine Co., The: *See—*
Attermeyer, Lawrence A., 3,603,624.
Cirulis, Uldis, to Nus Corporation. Conductivity sensor. 3,603,873, Cl. 324-30.
Clark, Wallace. Well drilling apparatus. 3,603,407, Cl. 175-6.
Clayton, Kenneth Hubert, to Wilmot-Breeden Limited. Sequence control circuits. 3,603,810, Cl. 307-232.
Cleare, Henry M., to Eastman Kodak Company. Electroradiographic process. 3,603,790, Cl. 250-65.
Clegg, Kenneth K., Jr. Soft hose clamp. 3,603,539, Cl. 248-79.
Clement, H. James: *See—*
Newman, Charles W.; and Clement, H. James,3,603,126.
Clementi, Anacleto: *See—*
Parmegiani, Mario; and Clementi, Anacleto,3,603,085.
Clements, Ralph E., to Barber-Colman Company. Transient voltage protection circuit for gate turn on devices. 3,603,843, Cl. 317-33.
Cleobury, Donald Jack, to General Electric company Limited, The. Synchronising arrangement for a pulse communication receiver. 3,603,735, Cl. 179-15.
Cochran, John M., Jr.; and O'Brien, Martin F., to Frontier Electronics, Inc. Monitoring apparatus for a textile winding machine. 3,603,518, Cl. 242-35.6
Cohen, Jerome Herbert, to Burtest Products Corporation. Press pads. 3,603,011, Cl. 38-66.
Coleman, Myron. Ladle lining. 3,603,050, Cl. 52-249.
Collins & Aikman Corporation: *See—*
Currier, Robert G.; Fonda, Carl R.; and Hayes, John T., 3,602,964.
Collins, A. Carl, Dr.: *See—*
Casey, Jesse Marion, 3,603,804.
Collins, Paul F., to A-T-O Inc. Baseball mitt or glove. 3,602,915, Cl. 2-19.
Collins Radio Company: *See—*
Weltha, Marvin D., 3,603,660.
Collins, William T., Jr.: *See—*
Speedy, Guido C.; and Collins, William T., Jr.,3,603,928.
Columbia Broadcasting System, Inc.: *See—*
Mc Mann, Renville H., Jr., 3,603,724.
Columbia Broadcasting Systems, Inc.: *See—*
Goldmark, Peter C.; and Christensen, John W., 3,603,665.
Columbia Research Laboratories, Inc.: *See—*
Alibert, Vernon F.; and Carey, Thomas H., 3,603,152.
Combustion Engineering, Inc.: *See—*
Bareiss, David A., 3,603,455.
Commissariat a l'Energie Atomique:*See—*
Chenault, Roger; Portal, Guy; Porrot, Emile; and Prigent, Raymond, 3,603,791.
Commissariat l'Energie Atomique:*See—*
Masselot, Yves J. M.; and Poujol, Georges, 3,603,712.
Commonwealth of Australia, The: *See—*
Metcalfe, Kenneth A.; and Smith, Ian E., 3,603,851.
Compagnie des Ateliers et Forges de la Loire (St-Chamond, Firminy, St.-Etienne Jacob Holtzer): *See—*
Ruget, Gabriel, 3,603,130.
Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie: *See—*
Lejeune, Daniel, 3,602,948.
Lejeune, Daniel, 3,603,719.
Computer Image Corporation: *See—*
Harrison, Lee, III, 3,603,964.
Confer, Robert E. Carton having tear strips for cans. 3,603,501, Cl. 229-51.
Connan, Andrew S. Tape casette holder. 3,603,478, Cl. 221-87.
Connelly, Francis X.: *See—*
Snow, Frederick O., III.; Connelly, Francis X.; Glazer, Harold; and Latincisics, Nandor K.,3,603,449.
Construction Machinery Company: *See—*
Johnson, James E., 3,603,565.
Constructions Radioelectriques et Electroniques du Centre: *See—*
Simeau, Bernard Jules Alexandre, 3,603,891.
Continental Can Company: *See—*
Lecinski, Frank H., Jr.; and Westfall, James E., 3,603,472.
Conwicke, Joel A., to Du Pont de Nemours, E. I., and Company. Method of fabricating radially oriented magnets. 3,602,986, Cl. 29-608.
Cook, Lloyd A.; and Buell, Lewis W. Sheet metal welding machine. 3,603,498, Cl. 228-4.
Cook, Ralph J., to Products Research and Chemical Corporation. In-line sealant dispenser. 3,603,487, Cl. 222-389.
Cooke, Charles L.: *See—*
White, Robert B.; and Cooke, Charles L.,3,603,329.
Cooper, George Samuel: *See—*
Billinger, Brian Arthur; MacNamara, Francis Peter; and Cooper, George Samuel,3,603,090.
Cooper, Lloyd R., to Heppenstall Company. Methods of producing large steel ingots. 3,603,374, Cl. 164-52.
Cooper, Thomas S., to International Business Machines Corporation. Drive system for a memory array. 3,603,938, Cl. 340-174.
Copeland, Jesse T., Jr., to United States of America, National Aeronautics and Space Administration. High speed photo-optical time recording. 3,603,974, Cl. 346-23.

Coppens, Mattheus J. M., to Inland Steel Company. Reconditionable containers. 3,603,476, Cl. 220-67.

Corcoran, Lyle S. Ammunition reloading press with angularly adjustable slide. 3,603,199, Cl. 86-24.

Cordiano, Ettore, to FIAT Societa per Azioni. Independent driven wheel suspension. 3,603,422, Cl. 180-73.

Corhanidis, Sebastien S. Gas distribution system for effecting heat exchange. 3,603,380, Cl. 165-2.

Cornelius Company, The: *See—*
Vp. Totten, Gilbert, 3,603,559.

Cornell Research Foundation, Inc.: *See—*
Stouffer, James R., 3,603,303.

Cossor, A. C., Limited: *See—*
Stevens, Michael Charles; and Swatton, Brian David, 3,603,889.

Cottrell, Michael J.; and Hudnall, Frederick W., to Textron Inc. Trenchduct connector units. 3,603,625, Cl. 287-189.36

Coulter Electronics, Inc.: *See—*
Coulter, Wallace H.; and Hogg, Walter R., 3,603,875.

Coulter, Wallace H.; and Hogg, Walter R., to Coulter Electronics, Inc. Particle analyzing method and apparatus employing multiple apertures and multiple channels per aperture. 3,603,875, Cl. 324-71.

Coursen, Richard Carl, to De Loval Turbine Inc. Hydraulic actuator. 3,603,083, Cl. 60-52.

Coutant, Ralph W.: *See—*
Promin, Robert M.; and Coutant, Ralph W.,3,603,451.

Coutino, Teodoro A. Cooked food product arrangement. 3,603,239, Cl. 99-239.

Cowley, John James, to Cervotec Developments Limited. Tunnelling means and method. 3,603,100, Cl. 61-84.

C/P Corporation: *See—*
Scott, Arthur L., 3,603,717.

Crain, Arthur: *See—*
Briana Anthony, M.; Crain, Arthur; Hatcher, Burrell R.; and Sheldon, Edward J.,3,604,000.

Crane, Harold E.; and Lord, Jack, to Allis, Louis, Company, The. Speed control mechanism for revolving doors. 3,603,856, Cl. 318-302.

Crane, Harold E.; and Lord, Jack, said Lord assor. to said Crane. Speed control mechanism for revolving doors. 3,603,857, Cl. 318-302.

Crawford Fitting Company: *See—*
Dodge, Harry G., 3,603,171.
Zahuranec, Emery J., 3,603,280.

Cripe, Maxwell L., to Bendix Corporation, The. Brake proportioning means. 3,603,558, Cl. 251-61.5

Cropps, John Edwin: *See—*
Bennett, Leonard Myer; and Cropps, John Edwin,3,603,146.

Cryer, Edward, to Lucas, Joseph, (Industries) Limited. Electrical switches. 3,603,748, Cl. 200-5.

Csaki, Joachim, to Ackermann u. Schmitt K.G. Wiring harness for electrical rotary machines. 3,603,824, Cl. 310-71.

Csakvary, Oscar: *See—*
Jureit, John Calvin; and Csakvary, Oscar,3,603,244.

Cucheran, John S.: *See—*
Pringle, William L.; and Cucheran, John S.,3,603,525.

Cuenoud, Gerard, to Battelle Memorial Institute. Method of controlling a polyphase inverter. 3,603,867, Cl. 321-61.

Cunningham, Sinclair Upton: *See—*
Firth, Donald; and Cunningham, Sinclair Upton,3,603,211.

Curetti, Glauco E.; and Ackermann, Ernest A., to Hoffco S.A. Apparatus for heat-shaping thin-walled containers of plastics material. 3,602,946, Cl. 18-20.

Curran, Bernard E., to Robertson, H. H., Company. Building wall panel and side joints therefor. 3,603,057, Cl. 52-478.

Current, James H; Ehlert, Harry C.; and Kilgore, Marion D., to Camco, Incorporated. Retrievable well packer. 3,603,388, Cl. 166-120.

Currier, Robert G.; Fonda, Carl R.; and Hayes, John T., to Collins & Aikman Corporation. Dual wall fabric with expandable height between layers. 3,602,964, Cl. 28-76.

Curry, John B. Method and tool for mounting lathe metal cutting tool bits for use on metal turning lathes for machining operations. 3,603,185, Cl. 82-36.

Curtiss-Wright Corporation: *See—*
Sneeden, Ralph J.; Brookes, Neil R.; and Watts, Hargus,, 3,603,082.

Cutler, Cassius Chapin, to Bell Telephone Laboratories, Incorporated. Conditional replenishment video system with reduced buffer memory delay. 3,603,725, Cl. 178-6.

Cutrone, Nicholas. Automatic teasing comb. 3,603,324, Cl. 132-136.

Dakin, Hayes O., Jr.: *See—*
Reese, Frank L.; and Dakin, Hayes O., Jr.,3,603,754.

Dale, Oivind, to Dale, Olav. Joint sealing hose. 3,603,055, Cl. 52-403.

Dale, Olav: *See—*
Dale, Oivind, 3,603,055.

Da Prato, Leo J., to Bell & Howell Company. Heart-shaped corona discharge device. 3,603,789, Cl. 250-49.5

Darbyshire, Peter: *See—*
Fry, William Lawrence; Royle, Antony Peter; and Darbyshire, Peter,3,603,758.

Darrell, George H. Target trap. 3,603,301, Cl. 124-32.

Dart Industries, Inc.: *See—*
Hardy, Donald Frederick, 3,603,645.

Davenport, Dallas N.; and Smith, Sidney Z., to General Tire & Rubber Company, The. Footwear article. 3,603,006, Cl. 36-11.5

Davies, Edward R.; and Gregory, Charles E., to Jered Industries, Inc. Anchor windlass for a marine vessel. 3,603,561, Cl. 254-150.

Davies, Guy E.; and Wilson, Christopher G. S., to Plessey Company Limited, The. Fluidic systems. 3,603,334, Cl. 137-81.5

Davis, Ariel R. Cordless electric cross connect panel with improved movable contact brush assembly. 3,603,747, Cl. 200-1.

Davis, Gordon Jerry, to Maytag Company, The. Subinterval timer drive system. 3,603,749, Cl. 200-38.

Davis, Homer S.; and Gay, Derek J., to Mattel, Inc. Launcher for oy aircraft. 3,603,024, Cl. 46-1.

Davis, James F. Progressively illuminated signs. 3,603,679, Cl. 353-75.

Davis, John W.; and Hill, Olen E., to United States of America, National Aeronautics and Space Administration. Wind tunnel test section. 3,602,920, Cl. 73-147.

Dawson, John Howard; and Fripp, David George Francis, to Marconi Company Limited, The. N-Parallel-path capacitive switched filter in which only incomplete spaced portions of input signal are sampled. 3,603,898, Cl. 333--070 0

Dawson, McGinty: *See—*
Casey, Jesse Marion, 3,603,804.

Day, Christopher C.; and Holte, Bo, to American Optical Corporation. Two-terminal bipolar self-powered low current limiter. 3,603,811, Cl. 307-237.

Day, Robert L.: *See—*
Smith, Edward A.; and Day, Robert L.,3,603,628.

Dayton Reliable Tool & Mfg. Company: *See—*
Eickenhorst, Franklin C.; and Fraze, Ermal C., 3,603,275.

Deal, Robert E., to United States of America, Air Force. Method and apparatus for locating cooperative personnel in densely foliated areas. 3,604,001, Cl. 343-18.

De Andres, Jesus; and Odone, Giovanni, to Paillard S.A. Telemeter having image flux separator with opaque area at an acute angle with the optical axis. 3,603,800, Cl. 250-220.

DeBitetto, Dominick John, to U.S. Philips Corporation, mesne. Composite diffraction grating formed from superimposed aligned gratings. 3,603,668, Cl. 350-162.

DEC International Inc.: *See—*
Peters, Norman J., 3,602,992.

Decca Limited: *See—*
Hughes, David Geoffrey, 3,603,893.

Decker, Hanns; and Stockmann, Helmut, to Klockner-Humboldt-Deutz Aktiengesellschaft. Crusher tool for gyratory crushers. 3,603,516, Cl. 241-293.

Deed, John W., to Master Specialties Company. Tape cartridge assembly having latch, pressure roller, transducers and terminals incorporated therein. 3,603,741, Cl. 179-100.22

Deere & Company: *See—*
Arnold, Loren Glenn; and Nelson, Richard Dale, 3,603,405.
Burrough, Donald E.; and Leinhauser, Joe Paul, 3,603,066.
Fickle, J. Clark; Thornbloom, Paul Julius; and Skromme, Arnold Burton, 3,603,486.

Degawa, Jiro; and Takeuchi, Osamu, to Sony Corporation. Cooling device for mercury-arc lamp or the like. 3,603,827, Cl. 313-24.

DeLisle, Gaston A.: *See—*
De Lisle, Gaston A., 3,603,276.

De Lisle, Gaston A., to DeLisle, Gaston A., as trustee. Flotation docking facility for small craft. 3,603,276, Cl. 114-45.

Del Mar Engineering Laboratories: *See—*
Thornton, William E., 3,603,881.

De Loval Turbine Inc.: *See—*
Coursen, Richard Carl, 3,603,083.

Denes, Peter A. Miniature board band low pass filters with multi- turn tape wound inductors. 3,603,902, Cl. 333-79.

De Oliveira, Egidio Lucas, to SI Handling Systems, Inc. Tow vehicle and signal adjusting system therefor. 3,603,263, Cl. 104-88.

DePackh, David C., to United States of America, Navy. High intensity electron beam generator. 3,603,838, Cl. 313-325.

DePinto, Joe A. Adjustable arm rest for automobiles. 3,603,637, Cl. 296-153.

De Polo, Maurice. Life saving support system. 3,603,535, Cl. 244-121.

DeRaad, Robert G., to United States of America, Army. Buffer device with torsion bar actuated brake shoes. 3,603,577, Cl. 267-151.

Detert, Klaus; Lipp, Hans-Jochen; and Winschuh, Erich, to Licentia Patent-Verwaltungs-G.m.b.H. Apparatus for testing the vane anchorage of turbine vanes. 3,603,143, Cl. 73-95.

Detro, Richard Gray, to General Electric Company. Vacuum seal. 3,603,661, Cl. 316-17.

Deutsche Texaco Aktiengesellschaft: *See—*
Gedenk, Rudolf Karl Heinz, 3,603,718.

DeVarda, Giorgio; Martinelli, Saverio; and Perna, Aldo, to Societa' Italiana Telecomunicazioni Siemens S.p.A. System for the modification of data stored in recirculating delay lines. 3,603,774, Cl. 235-168.

Devlin, James E. Atmospheric snow-melting and fog-dispersal apparatus. 3,603,507, Cl. 239-14.

Dheridon, Nicholas K.; and Kowalski, Daniel C., to United States of America, Air Force. System for generating instant contours from stereo pairs of aerial photographs. 3,603,682, Cl. 356-2.

Diamond International Corporation: *See—*
Bliss, George N., 3,603,458.

Diamond, Milton J.; and Lutch, Robert H., to General Motors Corporation. Ultrasonic measurement of material nodularity. 3,603,136, Cl. 73-67.8

Dick, A. B., Company: *See*—
Tonkin, Kenneth J.; and Gallagher, John P., 3,603,253.
Dickinson, Henry R., III. Book holder. 3,603,554, Cl. 248-451.
Didry, Yves. Rectangular cross-section member having two perpendicular entry channels. 3,603,054, Cl. 52-282.
Dietl, Hans: *See*—
Hylbert, Edgar W.; Tomaszewski, Bernd F. O.; Kleywegt, Jacob; and Dietl, Hans,3,603,370.
Dietzsch, Werner, to Huppe, Justin, Firma. Electrically operated venetian blind. 3,603,372, Cl. 160-168.
Dilger, Lawrence; and Ashford, Ernest S., to Veeder Industries Inc. Fluid dispensing apparatus control system. 3,603,481, Cl. 222-23.
Dimter, Erwin. Apparatus for pressure bonding two or more frame members in the forming of frame corners. 3,603,246, Cl. 100-93.
Ditges, Ernst, to Press und Stanswerk Craemer, Paul KG. Plastic pallet and die for producing the same. 3,603,272, Cl. 108-51.
Dochow, Heinz, to Kohnke, Richard Fallschirnwerk. Cargo parachute assembly. 3,603,536, Cl. 244-142.
Dodge, Harry G., to Crawford Fitting Company. Crank. 3,603,171, Cl. 74-548.
Doerner, Frank, to Doerner Products Co., Limited. Chair control. 3,603,553, Cl. 248-381.
Doerner, Joseph T., to Doerner Products Co., Limited. Chair control with torsion spring with tilting seat and chair back. 3,603,640, Cl. 297-292.
Doerner Products Co., Limited: *See*—
Doerner, Frank, 3,603,553.
Doerner, Joseph T., 3,603,640.
Dolata, Hans: *See*—
Stihl, Hans-Peter; Dolata, Hans; Sauermilch, Rolf; and Lude, Herman,3,603,179.
Dolfi, Eugene W. Baton structure. 3,603,196, Cl. 84-477.
Donti Research Development Manufacturing Corporation: *See*—
Levy, Donald; and Rusz, Tibor, 3,603,955.
Dore, John L., Co.: *See*—
Pope, Gerald R.; Weeden, Frank G.; and Petrosky, Willard L., 3,602,945.
Dorman, Frank D., to Thermo-Systems Inc. Pulsed anemometer circuit. 3,603,147, Cl. 73-204.
Doss, James D.; and Hagerman, Donald C., to United States of America, Atomic Energy Commission. High voltage regenerative pulse modulator. 3,603,887, Cl. 328-59.
Douglas, Howard N. Band saw catcher device. 3,603,361, Cl. 143-28.
Downs, Edgar S. Combination pressure atomizer and surface type burner for liquid fuel. 3,603,711, Cl. 431-352.
Dowty Rotol Limited: *See*—
Lane, Arthur H., 3,603,697.
Dransfield, A., & Co., Ltd.: *See*—
Fung, Kenneth Hing Cheung, 3,603,027.
Dreisbach, Robert H., to Magnavox Company, The. Sound transducer. 3,603,921, Cl. 340-10.
Dresher, Seymour, to Ingersoll-Rand Company. Plate type vibrator compactor. 3,603,224, Cl. 94-48.
Dresser Industries, Inc.: *See*—
Zurstadt, Herbert J., 3,603,151.
Droll, Hans. Apparatus for forming and transferring coils for stators. 3,602,972, Cl. 29-205.
Druart, Richard F.; and Herrick, Wallace D., to Bissell Inc. Shampooer with foam generating means. 3,602,933, Cl. 15-50.
Drucker, Doris. Automatic food handling apparatus. 3,603,241, Cl. 99-335.
Drumm, Arthur E. Rotary brush section. 3,602,936, Cl. 15-181.
Drummond, Peter R. Backwiring. 3,603,357, Cl. 140-147.
Drysdale, Thomas T. Distance measuring device. 3,603,929, Cl. 340-104.
Dual Gebruder Steidinger: *See*—
Laufer, Helmut, 3,603,598.
Dudley, Jack C.: *See*—
Huggins, Homer D.; and Dudley, Jack C.,3,603,384.
Dunn, Robert G.; and Walk, Emil J., to United States of America, Air Force. Warning interlock system for unlocked safes. 3,603,959, Cl. 340-274.
Du Pont de Nemours, E. I., and Company: *See*—
Banas, Edmund O., 3,603,102.
Barton, Robert Hall; Brown, Martin Luther; and Mitchell, Andrew, 3,603,221.
Conwicke, Joel A., 3,602,986.
Duris, Rudolph M.; and Spooner, Robert J., to Edwards Company, Inc. Programmed timing system. 3,603,961, Cl. 340-309.4
DuRocher, Gideon A., to Essex Wire Corporation. Variable intensith vehicle signaling system. 3,603,840, Cl. 315-82.
Dutcher, Daniel P., to Hoerner Waldorf Corporation. Hollow walled tray. 3,603,500, Cl. 229-34.
Dynamics Corporation of America: *See*—
Samuelian, Maurice P.; and Sachse, George E., Jr., 3,603,364.
Smith, Peter B., 3,603,751.
Dynotherm Corporation: *See*—
Scicchitano, Edward A., 3,603,767.
Dysart, Willis N. Mathematical teaching aid. 3,603,005, Cl. 35-30.
Eash, George H. Cartridge-retaining mechanism for tape decks and the like. 3,603,596, Cl. 274-4.
Eastman Kodak Company: *See*—
Bundschuh, John J., 3,603,529.
Cleare, Henry M., 3,603,790.
Kingsley, Charles R.; Kohler, John C.; Lehmann, Robert P.; and Ulmschneider Laurence A., 3,603,528.
Ormsby, Thomas R., 3,603,521.
Easton, Roger L.: *See*—
Bartholomew, Charles A.; and Easton, Roger L.,3,603,885.
Easton, Roger L.; Bartholomew, Charles A.; and Rovinski, Robert S., to United States of America, Navy. Passive temperature control for satellite. 3,603,530, Cl. 244-1.
Eaton, Carl J., to Champion Spark Plug Company. Spark plug with an internal resistor. 3,603,835, Cl. 313-118.
Ebstein, John W., to Gabriel Industries, Inc. Basketball goal. 3,603,588, Cl. 273-1.5
Eckert & Ziegler GmbH: *See*—
Bielfeldt, Friedrich Bernd, 3,602,950.
Eddens, Fletcher C.; and Reed, Karl F., II, to Anderson Electric Corporation. Cable clamp. 3,602,956, Cl. 24-125.
Edmund Scientific Co.: *See*—
Williams, Charles S., 3,603,195.
Edson, James O., to Bell Telephone Laboratories, Incorporated. Digital transmission system employing identifiable marker streams on pulses to fill all idle channels. 3,603,739, Cl. 179-15.
Edwards Company, Inc.: *See*—
Duris, Rudolph M.; and Spooner, Robert J., 3,603,961.
Edwards, Joseph N., to Reynolds Metals Company. Automatic control system for means for removing roll coating from a rolling mill work roll without removing the roll from the mill. 3,603,125, Cl. 72-21.
EEFP Corporation: *See*—
McCarthy, Robert, 3,603,240.
Ehlert, Harry C.: *See*—
Current, James H; Ehlert, Harry C.; and Kilgore, Marion D.,3,603,388.
Eichmann, Dieter: *See*—
Neuffer, Ingemar; Eichmann, Dieter; and Langweiler, Frank,3,603,869.
Eickenhorst, Franklin C.; and Fraze, Ermal C., to Dayton Reliable Tool & Mfg. Company. Method of forming can bodies. 3,603,275, Cl. 113-120.
Eie, Nils. Ski binding. 3,603,606, Cl. 280-11.35
Eilhardt, Bernd; and Ziemek, Gerhard Karl, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Arrangement for supporting one or several superconductors in the interior of a cryogenic cable. 3,603,715, Cl. 174-15.
Eisen-und Drahtwerk Erlau AG: *See*—
Muller, Anton, 3,603,371.
Elitex, Zavody textilniho strojirenstv generalni reditelstv: *See*—
Svoboda, Vladimir; and Vajda, Andrej, 3,603,117.
Elliott, Aldelbert J.; and Jones, Milton O., to United States of America, Atomic Energy Commission. Temperature control system. 3,603,107, Cl. 62-459.
Elliott Brothers (London) Limited: *See*—
Barltrop, Richard Kenneth, 3,603,534.
Elsworth, John F.; Atkins, Barry; and Sever, Bernard P., to Kenrick & Jefferson Limited. Apparatus for use in sequentially numbering documents. 3,603,251, Cl. 101-76.
Elzey, Patricia I.; and Weidknecht, John J. Connector for flexible knitting needle. 3,603,115, Cl. 66-117.
Engelsmann, Dieter, to Agfa-Gevaert Aktiengesellschaft. Film metering and shutter cocking device. 3,603,236, Cl. 95-31.
English Electric Company Limited, The: *See*—
Horton, Peter, 3,603,175.
Envirotech Corporation: *See*—
Chamberlain, Leon A.; Campbell, Clarence R.; and Stokes, Leif T., 3,603,450.
Erb, Richard I. Adjustable bicycle rack. 3,603,459, Cl. 211-20.
Erdmann, Clifford D. Time clock dimming control. 3,603,807, Cl. 307-141.
Erdmann, Hans, to International Telephone and Telegraph Corporation. Vehicle level control. 3,603,613, Cl. 280-124.
Erickson, Gerald. Interlocking means for divisible container carrier. 3,603,474, Cl. 220-23.4
Erickson, Gerald. Interlocking means for divisible container carrier. 3,603,475, Cl. 220-23.4
Erickson, Roy D., to Minnesota Mining and Manufacturing Company. Cable connector. 3,603,911, Cl. 339-267.
Ericsson Telephones Limited: *See*—
Morroll, Terence David, 3,603,736.
E. S. & A. Robinson (Canada) Limited: *See*—
Wright, Charles E.; and Gunyou, John, 3,603,217.
Eshelman, Cheston Lee. Shock absorbing tire buffer. 3,603,633, Cl. 293-19.
Eskeli, Michael: *See*—
Brashear, Buddy Joe; Stapleton, Donald Max; and Eskeli, Michael,3,603,699.
Eskeli, Michael. Rotating circular wing. 3,603,700, Cl. 416-180.
Esker, Donald W.; and Kroutil, Joseph, to McDonnell Douglas Corporation. Plasma arc thrustor. 3,603,089, Cl. 60-203.
Essex Wire Corporation: *See*—
DuRocher, Gideon A., 3,603,840.
Estes, James W.: *See*—
Geiger, Lewis J., Jr.; and Estes, James W.,3,603,571.
Etablissements D.F.: *See*—
Muller, Roger; and Fenner, Theodor, 3,603,191.
Etablissements Industriels Pierre A. Derobert &: *See*—
Frohlich, Jacques, 3,603,493.

Exley, David W.: *See—*
Richmond, Stuart; and Exley, David W.,3,603,103.

Fabbrica Italiana Magneti Marelli S.p.A.: *See—*
Ugo, Gilardelli, 3,603,858.

Fairbairn, Howard W., to Mettoy Company Limited, The. Toy or model vehicles. 3,603,031, Cl. 46-223.

Fandetti, Matthew R., to Pine Tree Engineering, and Cardwell Manufacturing Company, Inc. Position control device. 3,603,169, Cl. 74-501.5

Feld, Joseph J., to United States Steel Corporation. Belt fabric for plastic-pad-molding conveyor. 3,603,165, Cl. 74-239.

Fenn, George C. Adjustable support for apparatus for cleaning keg fittings of tapping systems. 3,603,328, Cl. 134-43.

Fenner, Theodor: *See—*
Muller, Roger; and Fenner, Theodor,3,603,191.

Ferdinand, Irwin J.; and Kulbersh, Irwin R., to Hirsh Company. Modular adjustable wall shelving. 3,603,274, Cl. 108-108.

Ferman, Nathan B. Article of furniture. 3,603,656, Cl. 312-195.

Ferrario, Bruno: *See—*
Zucchinelli, Mario; and Ferrario, Bruno,3,603,704.

FIAT Societa per Azioni: *See—*
Cordiano, Ettore, 3,603,422.
Sola, Giuseppe, 3,603,112.

Fiber Industries, Inc.: *See—*
Paliyenko, Paul; and Rollinson, Stanley, 3,603,043.

Fichtel & Sachs AG: *See—*
Lutz, Manfred; and Schulz, Horst, 3,603,178.

Fichter, Barry S.; and Bell, Edward H., to American Standard, Inc. Fluidically controlled refill mechanism with back flow preventer. 3,603,336, Cl. 137-81.5

Fickle, J. Clark; Thornbloom, Paul Julius; and Skromme, Arnold Burton, to Deere & Company. Endgate and endgate closure mechanism for a material unloader. 3,603,486, Cl. 222-311.

Figa, Rubin, to Adelphi Mobile Air Conditioners, Inc. Refrigeration apparatus for automotive vehicles. 3,603,105, Cl. 62-230.

Finch, Nigel, to Alfa-Laval Aktiebolag. Automated stall and milking equipment. 3,603,292, Cl. 119-14.1

Fink, Sidney. Architectural interior simulating arrangement. 3,603,004, Cl. 35-16.

Firth, Donald; and Cunningham, Sinclair Upton, to National Research Development Corporation. Linear or arcuate hydraulic pump or motor. 3,603,211, Cl. 91-501.

Fisher, Robert B.: *See—*
Byerley, Darrel D.; and Fisher, Robert B.,3,603,956.

Fishkis, Mikhail Mironovich: *See—*
Khrenov, Konstantin Konstantinovich; Chudakov, Vyacheslav Andreevich; Strogenov, Konstantin Vasilievich; Kleiman, Vladimir Leonidovich; Fishkis, Mikhail Mironovich; Nikolaev, Vyacheslav Mikhailovich; Kalnishevsky, Vladimir Konmunarovich; and Maltsev, Boris Mikhailovich,3,603,760.

Fitzpatrick, Glenn B.: *See—*
Williams, Barry E.; and Fitzpatrick, Glenn B.,3,603,994.

Fitzsimmons, George W.: *See—*
Robbins, Charles H.; Fitzsimmons, George W.; Hughes, Robert L.; and Moen, Robert L.,3,603,062.

Flachsbarth, Dieter, to Siemens Aktiengesellschaft. Circuit arrangements for pulsing the control current of a Hall generator. 3,603,821, Cl. 307-309.

Flagg, Robert F.: *See—*
Grinnell, Stuart W.; and Flagg, Robert F.,3,602,952.

Fleischer, Svend Sigurd Christie, to Gustavsson. Apparatus for mechanically folding inwardly and cutting an end portion of a length of tubular flexible material. 3,603,488, Cl. 223-37.

Fleisher, Olive E. Device for storing wigs. 3,603,489, Cl. 223-66.

Fleissner G.m.b.H.: *See—*
Fleissner, Heinz, 3,602,966.

Fleissner, Heinz, to Fleissner G.m.b.H. Process and apparatus for treating synthetic filament groups. 3,602,966, Cl. 28-1.2

Fling, John J., to International Telephone and Telegraph Corporation. Implicit beam angle control for a frequency scanning radar system. 3,604,002, Cl. 343-100.

Flodin, Allan T.: *See—*
Flodin, John F.; and Flodin, Allan T.,3,603,457.

Flodin, John F.; and Flodin, Allan T. Electronic product sizing apparatus. 3,603,457, Cl. 209-82.

Florjancic, Peter. Hydraulic apparatus, preferably closing apparatus for injection molding machines. 3,603,210, Cl. 91-404.

Flowers, Henry Fort. Tilting dump car door hinge. 3,603,266, Cl. 105-276.

FMC Corporation: *See—*
Billett, Ronald J.; Chamberlin, Donald W.; and McGee, Arthur L., 3,603,463.
Lind, Willard M., 3,603,557.
Mumma, Harold J.; and Parry, Curtis L., 3,603,249.
Nechine, Leonard M., 3,603,509.
Spurlin, William V., 3,603,416.
Stahr, Donald F.; and Yandrick, Rudolph M., 3,603,039.

Focht, Louis R., to Philco-Ford Corporation. Time-domain pitch detector and circuits for extracting a signal representative of pitch pulse spacing regularity in a speech wave. 3,603,738, Cl. 179-15.

Follen, Robert J.; Harman, Charles P., Jr.; and Meyer, Jackie R., to Honeywell Inc. Control apparatus. 3,603,993, Cl. 343-6.5

Fonda, Carl R.: *See—*
Currier, Robert G.; Fonda, Carl R.; and Hayes, John T.,3,602,964.

Ford Motor Company: *See—*
Krugler, Allen D., Jr., 3,603,157.

Forge, Regan and Engineering Company: *See—*
Watkins, Bruce J., 3,603,409.

Forster, Eckehard: *See—*
Geipel, Hans; Forster, Eckehard; Reinemann, Wilfried; and Roychoudhury, Nikhil,3,603,355.

Foster, Robert D. Machine for preparing shell-less hard cooked eggs. 3,603,243, Cl. 99-355.

Foti, Arem; and Albright, Roy H., to I-T-E Imperial Corporation. Insulator column arrangements for a high power electrical distribution system. 3,603,721, Cl. 174-141.

Fox, Roger A.: *See—*
Anderson, Arthur H.; and Fox, Roger A.,3,603,238.

Frank W. Manufacturer, Inc.: *See—*
Moffett, Oren D., 3,603,300.

Frankshtein, Boris Moiseevich. Root crop haulm cutter. 3,603,363, Cl. 146-85.

Frantz Virgil L., to Graham-White Sales Corporation. Pressure gauge assembly. 3,603,154, Cl. 73-420.

Frantz, Virgil L., to Graham-White Sales Corporation. Pivoted member assembly. 3,603,556, Cl. 248-479.

Fraser, Cameron R.: *See—*
O'Neil, Kevin B.; Fraser, Cameron R.; and Helms, Paul E., Jr.,3,603,071.

Fraze, Ermal C.: *See—*
Eickenhorst, Franklin C.; and Fraze, Ermal C.,3,603,275.

Fredd, John V., to Otis Engineering Corporation. Well tools. 3,603,110, Cl. 64-16.

Frederick, Alexander E.: *See—*
Manary, Leslie R.; and Frederick, Alexander E.,3,603,277.

Freeman, Michael H., to Pilkington Perkin-Elmer Limited. Head-up displays. 3,603,667, Cl. 350-103.

Freier, Michael; and Balazer, Leonard P., to Lockheed Missiles & Space Company. Range computer. 3,604,003, Cl. 343-112.

Fried, Krupp Gesellschaft mit beschrankter-Haftung: *See—*
Stedtnitz, Wolfgang Richard Ernst, 3,603,920.

Friedlaender, Ernst: *See—*
Kremp, Rudolf; Friedlaender, Ernst; and Winkler, Alfred,3,603,228.

Frink, Russell E., to Westinghouse Electric Corporation. Grounding-switch device. 3,603,752, Cl. 200-148.

Frink, Russell E., to Westinghouse Electric Corporation. Metalclad switchgear using vacuum interrupter elements. 3,603,753, Cl. 200-144.

Fripp, David George Francis: *See—*
Dawson, John Howard; and Fripp, David George Francis,3,603,898.

Fritz, Fred A., to Hercules, Incorporated. Electronic delay multiperiod initiating system. 3,603,844, Cl. 317-80.

Froelich, David B., to Spectrol Electronics Corporation. Dial mechanism for electronic components. 3,603,281, Cl. 116-115.

Frohlich, Jacques, to Etablissements Industriels Pierre A. Derobert & Cie. Bracelet, especially for a watch. 3,603,493, Cl. 224-4.

Frontier Electronics, Inc.: *See—*
Cochran, John M., Jr.; and O'Brien, Martin F., 3,603,518.

Fry, William Lawrence; Royle, Antony Peter; and Darbyshire, Peter, to Lucas, Joseph, (Industries) Limited. Contact breaker assemblies for use in internal combustion engine ignition systems. 3,603,758, Cl. 200-166.

Fujii, Yoshifusa: *See—*
Kobayashi, Tatsuo; Fujii, Yoshifusa; and Ueda, Hiroshi,3,603,781.

Fujiki Kousan Kabushiki Kaisha: *See—*
Manabe, Yoshikane, 3,603,038.

Fung, Kenneth Hing Cheung, to Dransfield, A., & Co., Ltd. Toy. 3,603,027, Cl. 46-44.

Furnish, Oren C.: *See—*
Abboud, Harry I.; and Furnish, Oren C.,3,603,569.

Gable, Gerald K., to Carrier Corporation. Liquid level sensor. 3,603,104, Cl. 62-148.

Gabriel Industries, Inc.: *See—*
Ebstein, John W., 3,603,588.

GAF Corporation: *See—*
Ulmer, Arnold G., 3,603,494.

Gakken Co., Ltd.: *See—*
Kishigami, Takaya, 3,603,026.

Galeone, Giulio, to S.C.E.I. Soc. Costuz, Elettrotermiche Industriali, S.p.A. Bell furnace for annealing treatment of metal sheets. 3,603,570, Cl. 263-40.

Gallagher, John P.: *See—*
Tonkin, Kenneth J.; and Gallagher, John P.,3,603,253.

Gallaro, Anthony V.; Kazuk, Walter F.; and Speigel, Kenneth, to GT&E Sylvania Incorporated. Luminescent screen having a separation medium therein. 3,603,792, Cl. 250-80.

Gallaro, Anthony V.; Kazuk, Walter F.; and Speigel, Kenneth, to Sylvania Electric Products, Inc. Penetration type color tube with phosphors separated by conductive barrier layer. 3,603,830, Cl. 313-92.

Galloway, Richard T.; and Brunk, David H., to United States of America, Navy. Steering computer and indicator. 3,603,775, Cl. 235-150.26

Ganter, Wolfgang, to Messrs, Gebruder Junghans G.m.b.H. Clockwork mechanism, especially alarm clock mechanism. 3,603,077, Cl. 58-22.5

Ganter, Wolfgang; and Otto, Heinz, to Messrs. Gebruder Junghans G.m.b.H. Clockwork TIME SWITCH. 3,603,074, Cl 58-16.
Garber, Donovan L.; Seidelle, James N.; and Miles, John R., to United States of America, Navy. Electro-optical simulator system. 3,603,726, Cl. 178-6.
Garbislander, Karl: *See—*
Bengesser, Karl; and Garbislander, Karl,3,603,619.
Garcia, Joseph A.: *See—*
Pierce, William C., 3,603,049.
Garcia, Roy C.: *See—*
Pierce, William C., 3,603,049.
Gardiner, Ernest Eugene: *See—*
Reed, Frederick Brydone; and Gardiner, Ernest Eugene,3,603,013.
Garitz, Karl Heinz: *See—*
Maronde, Herbert; and Garitz, Karl Heinz,3,603,227.
Garland, Carl C.: *See—*
Mottin, Ralph E.; and Garland, Carl C.,3,603,310.
Garnache, Richard R., to International Business Machines Corporation. Vapor deposition apparatus. 3,603,284, Cl. 118-48.
Gauchet, Yves M., to Societe Anonyme Poclaim. Means for stabilizing a civil engineering machine. 3,603,614, Cl. 280-150.5
Gavrish, Vasily Antonovich: *See—*
Juzvenko, Jury Arsenievich; Lanina, Tamara Vhdimirovna; Shimanovsky, Vasily Pavlovich; Gavrish, Vasily Antonovich; Paschenko, Mark Antonovich; Melnik, Alexandr Vasilievich; Zhurkovsky, Igor Sergeevich; and Vaksin, Moisei Isaakovich,3,603,763.
Gay, Derek J.: *See—*
Davis, Homer S.; and Gay, Derek J.,3,603,024.
Gebruder Junghans G.m.b.H.: *See—*
Wolber, Robert; and Assmus, Friedrich, 3,603,075.
Gedenk, Rudolf Karl Heinz, to Deutsche Texaco Aktiengesellschaft. Electrical cable structure. 3,603,718, Cl. 174-47.
Gegenheimer, Louis H.: *See—*
Keller, Thomas C.; and Gegenheimer, Louis H.,3,603,655.
Gehlen, Hermann Walter. Water propeller drive for amphibious vehicles. 3,603,278, Cl. 115-35.
Geiger, Lewis J., Jr.; and Estes, James W., to Air Reduction Company, Incorporated. Apparatus for melting scrap metal. 3,603,571, Cl. 266-25.
Geipel, Hans; Forster, Eckehard; Reinemann, Wilfried; and Roychoudhury, Nikhil, to Huttenwerk Oberhausen AG. Method of and means for stacking looped wire. 3,603,355, Cl. 140-2.
Gelfenbein, Evgeny Jukhimovich: *See—*
Khimich, Georgy Lukich; Niskovskikh, Vitaly Maximovich; Varaxin, Alexei Ivanovich; Gelfenbein, Evgeny Jukhimovich; and Bykov, Vladimir Alexandrovich,3,603,377.
General Dynamics Corporation: *See—*
Murchison, Jerre M.; and Antonio, Alexander G., 3,603,996.
General Electric and English Electric Companies Limited: *See—*
Wilson, Bernard, 3,603,882.
General Electric Company: *See—*
Adams, Max M.; and Underwood, Donald L., 3,603,940.
Aloi, Anthony J., 3,603,201.
Chase, Robert F.; and Sherman, Ralph R., Jr., 3,603,862.
Chengges, James L.; and Hart, Benjamin F., 3,603,444.
Detro, Richard Gray, 3,603,661.
Grossoehme, Floyd, 3,603,863.
Kast, Howard B.; and Buckley, Bruce S., 3,603,338.
Layman, John D., 3,602,994.
Owen, Radford K., 3,603,917.
Robbins, Charles H.; Fitzsimmons, George W.; Hughes, Robert L.; and Moen, Robert L., 3,603,062.
White, Frederick M., 3,603,631.
General Electric company Limited, The: *See—*
Cleobury, Donald Jack, 3,603,735.
General Motors Corporation: *See—*
Bird, Melvin R., 3,603,654.
Brucken, Byron L.; and Whyte, Ronal H., 3,603,118.
Campbell, David D., 3,603,425.
Carella, Richard F.; and Johnson, James J., 3,603,636.
Diamond, Milton J.; and Lutch, Robert H., 3,603,136.
Kelley, Oliver K., 3,602,937.
Laird, William F., 3,603,599.
Liebenthal, Benjamin C., 3,603,865.
Mitchell, Boris J., 3,603,296.
Shearer, Thomas W., Jr., 3,603,205.
Shepherd, Larry L., 3,603,429.
Sheridan, John J.; Bricker, Gene D.; and Wigner, Donald F., 3,603,825.
Speedy, Guido C.; and Collins, William T., Jr., 3,603,928.
Tipping, Roderick G.; and Phillips, William V., 3,603,176.
Vigor, Charles W.; and Musial, Joseph A., 3,603,186.
General Safety Inc.: *See—*
Windham, Edward F., 3,603,629.
General Tire & Rubber Company, The: *See—*
Davenport, Dallas N.; and Smith, Sidney Z., 3,603,006.
General Trailer Co.: *See—*
Schmidt, Kenneth J.; and Lacock, James A., 3,603,418.
George, James F.: *See—*
Abromavage, John C.; and George, James F.,3,603,674.
George, John Barrett, to RCA Corporation. Instant-on circuitry for solid state television receivers. 3,603,732, Cl. 178-7.5
Gerlach, Heinz. Annular hose-clip. 3,602,954, Cl. 24-20.
Geyer, Howard M., to Pneumo Dynamics Corporation. Servo actuator and locking mechanism therefor. 3,603,212, Cl. 92-17.
Giangrande, Mario L.: *See—*
Albizati, Peter J.; Asin, Samson; Beers, Alfred B.; Child, Thomas A.; and Giangrande, Mario L.,3,603,366.
Gilbert & Barker Manufacturing Company: *See—*
Belue, Fred M., 3,603,359.
Gilchrist, Lee D. Method of knitting. 3,603,113, Cl. 66-172.
Gill, John J. Furnace removal. 3,603,573, Cl. 266-36.
Gillette Company, The: *See—*
Adams, Max M.; and Underwood, Donald L., 3,603,940.
Gilmore, Ralph Edward. Remote control by relays of components of an internal combustion engine-powered vehicle. 3,604,005, Cl. 343-225.
Girala, Anthony S., to United States of America, National Aeronautics and Space Administration. Open type urine receptacle. 3,602,923, Cl. 4-110.
Girling Limited: *See—*
Osborne , Arthur P., 3,603,927.
Wenham, Graham J., 3,603,611.
Wilson, Alexander J., 3,603,649.
Glaesener, Ernest, to Arbed, Acieries Reunies de Burback-Eich-Dudelange. Vehicle guard rails. 3,603,562, Cl. 256-13.1
Glass, Eduard. Method of and apparatus for weaving without knots. 3,603,353, Cl. 139-370.
Glazener, Carey A.: *See—*
Pray, Lester W.; and Glazener, Carey A.,3,603,440.
Glazer, Harold: *See—*
Snow, Frederick O., III.; Connelly, Francis X.; Glazer, Harold; and Latincisics, Nandor K.,3,603,449.
Glindmeyer, Friedrich, to William Prym-Werke KG. Lock slider. 3,602,958, Cl. 24-205.14
Goggins, William B., Jr.; and Schindler, John K., to United States of America, Air Force. Dual harmonic frequency synthetic aperture radar. 3,603,992, Cl. 343-5.
Gohler, Otto, to Agria-Werke, GmbH. Motor-driven single axle agricultural machine. 3,603,162, Cl. 74-16.
Gold, Kenneth Stewart: *See—*
Pelta, Edmond R.; and Gold, Kenneth Stewart,3,603,879.
Goldmark, Peter C.; and Christensen, John W., to Columbia Broadcasting Systems, Inc. Fiber optics disk scanning systems. 3,603,665, Cl. 350-96.
Golobart, Ramon Balaquer. Carriage for inserting and tightening weft yarns. 3,603,352, Cl. 139-122.
Good, Arthur L., to Robertshaw Controls Company. Fuel control system and parts therefor or the like. 3,603,708, Cl. 431-45.
Goodyear Tire & Rubber Company, The: *See—*
Hylbert, Edgar W.; Tomaszewski, Bernd F. O.; Kleywegt, Jacob; and Dietl, Hans, 3,603,370.
Kaut, George A., 3,602,949.
O'Neil, Kevin B.; Fraser, Cameron R.; and Helms, Paul E., Jr., 3,603,071.
Goralnick, Norman S. Siren-horn circuitry. 3,603,985, Cl. 340-384.
Gordon, Bernard M., to Gordon Engineering Company. Device for analog to digital conversion or digital to analog conversion. 3,603,975, Cl. 340-347.
Gordon Engineering Company: *See—*
Gordon, Bernard M., 3,603,975.
Gouge, Edwin; and McDonald, James E. Golf-bag support. 3,603,540, Cl. 248-96.
Gould, John M.: *See—*
Paine, T. O., Administrator of the National Aeronautics and Space Administration with respect to an invention of,; Wyman, Charles L.; Gould, John M.; Johnson, Robert E.; and Weiss, Paul F.,3,603,686.
Goyue, Emmanuel V.: *See—*
Reinfeld, Kurt; and Goyue, Emmanuel V.,3,603,376.
Grace, W. R., & Co.: *See—*
Peray, Jean-Marie, 3,603,397.
Gradko Glass Laboratories, Inc.: *See—*
Konkol, Timothy, 3,603,156.
Graflex, Inc.: *See—*
McFadden, Robert N., 3,603,520.
Graham, Olin L., to United States of America, National Aeronautics and Space Administration. Color television system. 3,603,722, Cl. 178-5.2
Graham-White Sales Corporation: *See—*
Frantz Virgil L., 3,603,154.
Frantz, Virgil L., 3,603,556.
Grass, Johann, to Arn. Kiekert Sohne, Firma. Vehicular door latch. 3,603,632, Cl. 292-224.
Grebene, Alan Bebin: *See—*
Camenzind, Hans Rudolph; Grebene, Alan Bebin; and Kleitman, David,3,603,890.
Green, Norman F., to United States of America, Air Force. Mechanical fuzing system. 3,603,258, Cl. 102-79.
Greene, Clifford E.: *See—*
Krasin, Lester Q.; and Greene, Clifford E.,3,603,744.
Gregg, Paul V., to Tenneco Inc., mesne. Three punch bending press. 3,603,131, Cl. 72-389.
Gregg, Roland S., Jr.; and Hoegeman, Herman F., Jr., to Bunker-Ramo Corporation, The. Data display system. 3,603,966, Cl. 340-324.
Gregory, Charles E.: *See—*
Davies, Edward R.; and Gregory, Charles E.,3,603,561.

Greive, Aloys, to Hamel G.m.b.H. Zwirnerel-und Spinnereimasachinen. Belt-type drive arrangement for spinning machines and the like. 3,603,069, Cl. 57-105.

Grier, John D. Conductor configurations for discharge panels. 3,603,836, Cl. 313-201.

Griffith, Richard W., to Sun Shipbuilding & Dry Dock Company. Trailer support device. 3,603,544, Cl. 248-119.

Grill, Werner K.; and Link, Howard D., to Christensen Diamond Products Company. Retractable drill bits. 3,603,413, Cl. 175-261.

Grille, Michael. Refuse bag holding rack. 3,603,542, Cl. 248-98.

Grinnell, Stuart W.; and Flagg, Robert F., to Kdi Hδlex Incorporated, mesne. Instrument for measuring threshold voltage of a semiconductor explosive initiator. 3,602,952, Cl. 324-62.

Groetschel, Karl Maria. Roof supports for mine workings. 3,603,098, Cl. 61-45.

Grossoehme, Floyd, to General Electric Company. Circuitry for generating a square wave of fixed voltage amplitude and variable frequency. 3,603,863, Cl. 321-2.

Grube, William L., to MacLean-Fogg Lock Nut Co. Method for controlling clamping load of a threaded fastener. 3,602,976, Cl. 29-407.

Grubel, Stanley J.; La Rou, Joseph E.; and Stirling, Hugh R., to International Business Machines Corporation. Pulse circuit employing delay line to delimit output frequency. 3,603,897, Cl. 331-107.

Grundy, Reed H., to Westinghouse Air Brake Company. High speed rate indicator having improved metering circuit. 3,603,876, Cl. 324-78.

GT&E Sylvania Incorporated: *See—*
Gallaro, Anthony V.; Kazuk, Walter F.; and Speigel, Kenneth, 3,603,792.

Guminski, Alfons: *See—*
Lohmann, Gunther; and Guminski, Alfons,3,603,515.

Gunyou, John: *See—*
Wright, Charles E.; and Gunyou, John,3,603,217.

Gustavsson: *See—*
Fleischer, Svend Sigurd Christie, 3,603,488.

Gyorgy, Ernst M.; Jaeger, Raymond E.; and Seidel, Harold, to Bell Telephone Laboratories, Incorporated. High Q microwave cavity. 3,603,899, Cl. 333-73.

Haake, Robert, to Bell & Howell Company. Tape recorder. 3,603,597, Cl. 274-4.

Haddix, Robert J.: *See—*
Hott, Ion V. K.; and Haddix, Robert J.,3,603,609.

Hadfield, Robert W.; and Harding, William H., to Textron Inc. Carpet-underfloor adaptor. 3,603,048, Cl. 52-221.

Haeusler, Jochen: *See—*
Seiffert, Helmut; and Haeusler, Jochen,3,603,127.

Hafner, Theodore. Temperature controlled surface wave feeder lines. 3,603,904, Cl. 333-95.

Hagerman, Donald C.: *See—*
Doss, James D.; and Hagerman, Donald C.,3,603,887.

Hahn, Erich, to Billstein, August, Firma. Hydro-pneumatic suspension unit with automatic level regulation. 3,603,576, Cl. 267-64.

Hair, George D., Jr.; and Haney, William P., to Texas Instruments, Incorporated. High resolution frequency wave number spectra for detection and location of weak signals. 3,603,922, Cl. 340-15.5

Hall, James N., to United States of America, Atomic Energy Commission. Field effect transistor as a buffer for a small signal circuit. 3,603,813, Cl. 307-237.

Hall, Jeffrey, to Houdaille Industries, Inc. Damper. 3,603,172, Cl. 74-574.

Hall, Robert Dale, to Rohr Corporation. Turret type large aperture antenna precision mounted on circular track. 3,604,011, Cl. 343-766.

Halldorson, Halldor K.; and Nelson, Irving O. Collapsible tent. 3,603,330, Cl. 135-1.

Hallis, Thomas, Jr., to Union Oil Company of California. Method for improving the bending quality of water resistant corrugated paperboard. 3,603,219, Cl. 93-49.

Hallquist, Arthur L.: *See—*
Maloney, William R.; and Hallquist, Arthur L.,3,603,585.

Halstead, William M. Tool for removing and replacing integrated circuit flat pack modules. 3,602,971, Cl. 29-203.

Ham, Alexander Jan. Spray nozzles. 3,603,512, Cl. 239-504.

Hamel G.m.b.H. Zwirnerel-und Spinnereimasachinen: *See—*
Greive, Aloys, 3,603,069.

Hamilton Cosco, Inc.: *See—*
Brown, Jerry A.; and Schroer, Charles E., 3,603,519.

Hamilton, Ralph A., to Lockheed Aircraft Corporation. Laser control for automatic alignment of structures. 3,603,691, Cl. 356-152.

Hamilton-Hastings Company Ltd.: *See—*
Novak, Emil J., 3,603,834.

Hamm, Ronald D. Device for feeding paint to a painting brush. 3,603,694, Cl. 401-150.

Haney, William P.: *See—*
Hair, George D., Jr.; and Haney, William P.,3,603,922.

Hanses, Otto. Scaffolding for the tanks of large tanker ships. 3,603,428, Cl. 182-82.

Happe, Karl G. T. Ice fishing apparatus. 3,603,017, Cl. 43-17.

Hara, Hisashi: *See—*
Sato, Tai; Takeishi, Yoshiyuki; Okamoto, Yoshihiko; and Hara, Hisashi,3,603,848.

Harbert, Forest K. Stop warning device for vehicles. 3,603,924, Cl. 340-52.

Hard, Thomas M., to United States of America, National Aeronautics and Space Administration. Optical systems having spatially invariant outputs. 3,603,690, Cl. 356-113.

Harding, William H.: *See—*
Hadfield, Robert W.; and Harding, William H.,3,603,048.

Hardy, Donald Frederick, to Dart Industries, Inc. Air speed assist. 3,603,645, Cl. 302-2.

Hardy, Henry W., Jr.: *See—*
Terral, Ben D.; and Hardy, Henry W., Jr.,3,603,393.

Harman, Charles P., Jr.: *See—*
Follen, Robert J.; Harman, Charles P., Jr.; and Meyer, Jackie R.,3,603,993.

Harmes, Oren B., to Metronics Incorporated. Box sealing machine. 3,603,061, Cl. 53-374.

Harms, Volker W., to United States of America, National Aeronautics and Space Administration. Apparatus for automatically stabilizing the attitude of a non-guided vehicle. 3,603,532, Cl. 244-3.21

Harper, George C.: *See—*
Anderson, Lloyd E., Sr.; Harper, George C.; Leber, William; and Miller, Charles G.,3,603,204.

Harries, Gwynfor Maple. Manure spreader. 3,603,513, Cl. 239-657.

Harris, Ben A., to Rochester Instrument Systems, Inc. Events recorder. 3,603,986, Cl. 340-415.

Harris, Rano J., Jr.: *See—*
Harris, Rano J., Sr.; and Harris, Rano J., Jr.,3,603,471.

Harris, Rano J., Sr.; and Harris, Rano J., Jr., to Precision Sampling Corporation. Septum valves. 3,603,471, Cl. 215-37.

Harris, Thomas J.; Kosanke, Kurt M.; Kulcke, Werner W.; and Max, Erhard, to International Business Machines Corporation. Electro-optic information readout device using polarized laser light. 3,603,801, Cl. 250-225.

Harrison, Lee, III, to Computer Image Corporation. Means and method for semi-automatically sequencing the generation of components for an electronic image display. 3,603,964, Cl. 340-324.

Hart, Benjamin F.: *See—*
Chengges, James L.; and Hart, Benjamin F.,3,603,444.

Harter, Mary C.: *See—*
Mighton, Perceptimus J., 3,603,045.

Hartford, Thomas W., to Bendix Corporation, The. Redundant sprocket logic system for machine tool numerical control. 3,603,950, Cl. 340-222.

Haschek, Friedrich: *See—*
Loos, Kurt; and Haschek, Friedrich,3,603,373.

Hashizume, Toichi; Nagai, Isao; Umeda, Katsuhiko; Otokuni, Tadaaki; and Takahashi, Yuji, to Nissan Motor Company, Limited. Friction clutch for an automobile. 3,603,438, Cl. 192-107.

Hassay, William F. Refrigerated safety cabinet. 3,603,657, Cl. 312-214.

Hasty, John M., Jr., to Lockheed Aircraft Corporation. Strain relief clamp for electrical wiring connector. 3,603,913, Cl. 339-104.

Hatcher, Burrell R.: *See—*
Briana Anthony, M.; Crain, Arthur; Hatcher, Burrell R.; and Sheldon, Edward J.,3,604,000.

Hatori, Kozo; Watanabe, Hitoshi; and Yoshida, Nobuyoshi, to Nippon Electric Company, Limited. Distributed constant RC network. 3,603,900, Cl. 333-75.

Hauerbach, Markvard, to Stromberg Datagraphix, Inc. Character generator. 3,603,967, Cl. 340-324.

Hauni-Werke Korber & Co. KG.: *See—*
Schubert, Bernhard, 3,603,058.
Zausch, Wolfgang; and Wahle, Gunter, 3,603,445.

Havens, Richard Calvin, to Motorola, Inc. Microwave printed circuit negative resistance oscillator. 3,603,896, Cl. 331-96.

Hawkins, George C.: *See—*
Zaura, Paul J., Jr; Hawkins, George C.; and Cannalte, Gary A.,3,603,884.

Hayes, John T.: *See—*
Currier, Robert G.; Fonda, Carl R.; and Hayes, John T.,3,602,964.

Haynes, Belinda. Flat irons. 3,603,012, Cl. 38-97.

Heald Machine Company, The: *See—*
Youden, David H., 3,603,652.

Heath, Harold F., Jr.; and Husson, Samir S., to International Business Machines Corporation. Data processing system capable of operation despite a malfunction. 3,603,934, Cl. 340-172.5

Heath, Ronald Alfred, to Lucas, Joseph, (Industries) Limited. Fluidic switching circuit. 3,603,337, Cl. 137-81.5

Heffner, Robert E., to Aluminum Company of America. Method for forming a sheet metal joint. 3,602,980, Cl. 29-509.

Heflinger, Lee O.; and Wuerker, Ralph F., to TRW, Inc. Multi-frequency lasers for holographic contouring. 3,603,685, Cl. 356-109.

Heflinger, Lee O.: *See—*
Wuerker, Ralph F.; and Heflinger, Lee O.,3,603,662.

Heick, Robert B.; and Mann, Henry, to Bell Telephone Laboratories, Incorporated. Measurement of average duty cycle. 3,603,746, Cl. 179-175.2

Heidecker, Robert F., to International Business Machines Corporation. Predifferentiated recording. 3,603,942, Cl. 340-174.16

Heilmeier, George Harry; and Zanoni, Louis Anthony, to RCA Corporation. Panel structure for matrix addressed displays. 3,603,984, Cl. 340-378.

Heinrich, Eckart: *See—*
Heinrich, Hans Joachim,3,602,991.

Heinrich, Edith: *See—*
Heinrich, Hans Joachim,3,602,991.

Heinrich, Hans Joachim, deceased0 (by Heinrich, Edith0Heinrich, Eckart; legal heirs), to BALCO Filtertechnik GmbH. Shearing foil for a dry-shaving razor. 3,602,991, Cl. 30-346.5

Heintschel-Heinegg, Egbert: *See—*
Adolff, Jurgen Martin; Heintschel-Heinegg, Egbert; and Loskant, Winfried,3,602,968.

Heisler, Raymond A. Grip transfer arm. 3,603,356, Cl. 140-75.

Helms, Paul E., Jr.: *See—*
O'Neil, Kevin B.; Fraser, Cameron R.; and Helms, Paul E., Jr.,3,603,071.

Heltzel, Robert E. Concrete road joint strip installer. 3,603,222, Cl. 94-39.

Helzer, Florence V. Pillow construction. 3,602,928, Cl. 5-338.

Henderson, Albert G., to United States of America, Air Force. Ablator densiometer and void detector. 3,602,997, Cl. 33-169.

Hendrix, Hurshel V., to Phillips Petroleum Company. Method of recovering storage volume in an underground cavern. 3,603,095, Cl. 61-0.5

Hennig, Walter: *See—*
Strehle, Horst; Hennig, Walter; Wiessner, Manfred; and Schulze, Heinz,3,603,234.

Henry, Robert R., to Yorkshire Industries, Inc. Transverse and axial positioning apparatus. 3,603,163, Cl. 74-22.

Heppenstall Company: *See—*
Cooper, Lloyd R., 3,603,374.

Herbert, William B. Resilient coupling. 3,603,108, Cl. 64-13.

Hercules, Incorporated: *See—*
Fritz, Fred A., 3,603,844.

Herman, Ronald E.: *See—*
Sherwin, Harry A.; and Herman, Ronald E.,3,603,297.

H. Ernault-Souma: *See—*
Berly, Marcel, 3,603,184.

Heron, Harold Gladstone. Aerial balancing toy. 3,603,032, Cl. 46-244.

Herr Manufacturing Company, Inc.: *See—*
Atwood, Hyatt B.; and McLean, James N., 3,603,070.

Herrera, Jose Pardo. Hydraulic balancing mechanism. 3,603,578, Cl. 267-128.

Herrick, Wallace D.: *See—*
Druart, Richard F.; and Herrick, Wallace D.,3,602,933.

Herrmann, Helmut, to Metalloxyd GmbH. Tape winding apparatus. 3,603,522, Cl. 242-56.

Hertrich, Friedrich R., to International Business Machines Corporation. Signal recovery system utilizing amplitude comparison at the beginning and end of a bit period. 3,603,945, Cl. 340-174.1

Hess, Raoul: *See—*
Neuville, Bernard; Ledoux, Claude; and Hess, Raoul,3,602,943.

Heth, Sherman C., to Jacobsen Manufacturing Company. Snow thrower auger with replaceable paddle. 3,603,008, Cl. 37-43.

Heubl, Walter. spaced interfittable projections. 3,603,025, Cl. 46-25.

Hewitt-Robins Incorporated: *See—*
Promin, Robert M.; and Coutant, Ralph W., 3,603,451.
Snow, Frederick O., III.; Connelly, Francis X.; Glazer, Harold; and Latincisics, Nandor K., 3,603,449.

Higham, Peter: *See—*
Caunter, Jeffrey Malcolm; and Higham, Peter,3,603,871.

Hilbert, Francis H.: *See—*
Cecchin, Gildo; and Hilbert, Francis H.,3,603,894.

Hill, Gerald L. Master copy or patterns for machine forming of monograms and method of using same. 3,602,996, Cl. 33-23.

Hill, Olen E.: *See—*
Davis, John W.; and Hill, Olen E.,3,602,920.

Hill, William Frank; and Phoenix, Lancelot, to Lucas. Joseph, (Industries) Limited. Suspension systems for road vehicles. 3,603,612, Cl. 280-124.

Hills, James F., to Applied Technical Services, Inc. Stabilizing and leveling device. 3,603,547, Cl. 248-188.2

Himmelstein, Joseph M. Speed monitor system and method using impulsive ignition noise. 3,603,878, Cl. 324-169.

Hiraiwa, Atsumu: *See—*
Terada, Kinji; Inariba, Tokuzo; Hiraiwa, Atsumu; and Taniguchi, Takeshi,3,603,073.

Hirota, Masao; Nakarai, Kazumi; Io, Kenji; Tanaka, Keiji; and Matsuda, Katsuji, to Mitsui Toatsu Chemicals, Incorporated. Method of separating peat into fibrous substance and humic substance. 3,603,643, Cl. 299-9.

Hirsch, James A.; and Sheldon, Robert F., to Mallory, P. R., & Co. Inc. Control system providing directional current flow to a motor for a timer. 3,603,852, Cl. 318-102.

Hirsh Company: *See—*
Ferdinand, Irwin J.; and Kulbersh, Irwin R., 3,603,274.

Hirt, Alfred, to Brown & Sharpe Manufacturing Company. Pneumatic logic element. 3,603,346, Cl. 137-608.

Hiruma, Kenji, to Kabushiki Kaisha Ricoh. Roof-type reflecting mirror for viewfinder of single lens reflex camera. 3,603,200, Cl. 88-1.5

Hitachi, Ltd.: *See—*
Ohashi, Shin-ichi, 3,603,814.

Hitzke, Milton H., to Carrier Corporation. Refrigeration system control. 3,603,806, Cl. 307-126.

Hock, Fromund, to Leitz, Ernst, G.m.b.H. Alignment telescope. 3,603,687, Cl. 356-153.

Hoegeman, Herman F., Jr.: *See—*
Gregg, Roland S., Jr.; and Hoegeman, Herman F., Jr.,3,603,966.

Hoerner Waldorf Corporation: *See—*
Dutcher, Daniel P., 3,603,500.

Hoffco S.A.: *See—*
Curetti, Glauco E.; and Ackermann, Ernest A., 3,602,946.

Hofliger & Karg: *See—*
Moser, Theo, 3,603,462.

Hogan, William M.: *See—*
McDonald, William N.; and Hogan, William M.,3,603,517.

Hogg, Walter R.: *See—*
Coulter, Wallace H.; and Hogg, Walter R.,3,603,875.

Holland, William Edward, to Monsanto Company. Blender-pump. 3,603,563, Cl. 259-7.

Holley Carburetor Company: *See—*
Canale, Raymond P., 3,603,332.

Hollinger, Walter P.: *See—*
Van Winkle, Edgar W.; Kosakowski, Henry R.; and Hollinger, Walter P.,3,603,980.

Holloway, James C.: *See—*
Ireland, John W.; and Holloway, James C.,3,603,768.

Holmes, Horace D., to Masco Corporation. Tool for making lock nut assemblies. 3,603,132, Cl. 72-402.

Holtan, Maurice O. Semi-automatic transmission. 3,603,166, Cl. 74-331.

Holte, Bo: *See—*
Day, Christopher C.; and Holte, Bo,3,603,811.

Holzer-Patent AG: *See—*
Apel, Konstantin, 3,603,805.

Honeywell Inc.: *See—*
Follen, Robert J.; Harman, Charles P., Jr.; and Meyer, Jackie R., 3,603,993.

Hooks, John P. Trailer trolley indicator. 3,603,279, Cl. 116-28.

Horne, Edgar J.; and Spohn, Ralph C., to Ametek, Inc. Instrument illumination. 3,603,779, Cl. 240-2.1

Horner, Ellwood J., to Wood Industries, Inc., mesne. Saddle clamping device. 3,603,255, Cl. 101-378.

Horsman Dolls Inc.: *See—*
Nutting, William B., 3,603,029.

Horton, Peter, to English Electric Company Limited, The. Plural drive clutches with automatic lock. 3,603,175, Cl. 74-625.

Horwinski, Elwood R., to Lewis Engineering Company. Automatic fire extinguishing apparatus. 3,603,403, Cl. 169-5.

Hott, Ion V. K.; and Haddix, Robert J., to Joyce-Cridland Company, The. Combination standing and sitting structure. 3,603,609, Cl. 280-62.

Houdaille Industries, Inc.: *See—*
Hall, Jeffrey, 3,603,172.

Hough, Howard O. Combination fire and burglar alarm system. 3,603,973, Cl. 340-409.

Howard, Dean D., to United States of America, Navy. Signal processor for diversity frequency radar. 3,603,995, Cl. 343-7.3

Howard, Sam B.; and Black, Kendrick E., to Mead Corporation, The. Reclosable carton. 3,603,502, Cl. 229-51.

Hoyt, Donald L., to Texaco Inc. Interface advance control in secondary recovery program by reshaping of the interface between driving and driven fluids and by retarding cusp formation. 3,603,395, Cl. 166-245.

Hoyt, Hazen L., III: *See—*
Weigl, John W.; and Hoyt, Hazen L., III,3,603,730.

Hubbs, Charles H., 25% to McLowe, Allan, and King, Ralph J. Universal chemical delivery system. 3,603,506, Cl. 239-1.

Huber, Hans-Peter: *See—*
Wagner, Karl; and Huber, Hans-Peter,3,603,230.

Hudnall, Frederick W.: *See—*
Cottrell, Michael J.; and Hudnall, Frederick W.,3,603,625.

Hudson, Arthur F. Bearing arrangement. 3,603,653, Cl. 308-6.

Huet, Jean-Jacques Henri Oscar; and Massaux, Henry Berthe Marie Joseph, to Centre d'Etude de Energie Nuclearie C.E.H. Method of production of an alloy. 3,602,977, Cl. 29-420.

Huggins, Homer D.; and Dudley, Jack C., to Modine Manufacturing Company. Expandable tube, and heat exchanger. 3,603,384, Cl. 165-181.

Huggins, James A., to Illinois Tool Works, Inc. Sliding wedge-type removable guide needle. 3,603,311, Cl. 128-214.4

Hughes Aircraft Company: *See—*
Behnke, Marvin C., 3,604,009.
Williams, Barry E.; and Fitzpatrick, Glenn B., 3,603,994.

Hughes, David Geoffrey, to Decca Limited. Phase locked oscillators. 3,603,893, Cl. 331-17.

Hughes, Harold W.; and Stone, Samuel E., to Bendix Corporation, The. Master cylinder reservoir level indicator. 3,603,925, Cl. 340-59.

Hughes, Robert L.: *See—*
Robbins, Charles H.; Fitzsimmons, George W.; Hughes, Robert L.; and Moen, Robert L.,3,603,062.

Huller, Karl, G.m.b.H.: *See—*
Lutz, Adolf, 3,603,600.

Humphrey, Stanley, Jr. Automobile servicing unit. 3,603,046, Cl. 52-173.

Hupfauf, Lorenz, to Vereinigte Flugtechnische Werke Fokker GmbH. Stacking apparatus. 3,603,586, Cl. 271-64.

Huppe, Justin, Firma: *See—*
Dietzsch, Werner, 3,603,372.

Husson, Samir S.: *See—*
Heath, Harold F., Jr.; and Husson, Samir S.,3,603,934.

Hutchinson, Stanley O.; and McKinnell, John C., to Chevron Research Company. Method of placing particulate material in an earth formation with foam. 3,603,398, Cl. 166-305.

Huttenwerk Oberhausen AG: *See—*
Geipel, Hans; Forster, Eckehard; Reinemann, Wilfried; and Roychoudhury, Nikhil, 3,603,355.

Huyck Corporation: *See—*
Lee, Charles Allen; and Wagner, Joseph Robert, 3,603,354.

Hylbert, Edgar W.; Tomaszewski, Bernd F. O.; Kleywegt, Jacob; and Dietl, Hans, to Goodyear Tire & Rubber Company, The. Pneumatic tire. 3,603,370, Cl. 152-209.

Hyoudou, Miyako: *See—*
Mori, Miyoshi; and Hyoudou, Miyako,3,603,693.

Hypro, Inc.: *See—*
Leschisin, John, 3,603,215.

I-T-E Imperial Corporation: *See—*
Foti, Arem; and Albright, Roy H., 3,603,721.

Ide, Allan R., to Metropolitan Stevedore Company. Load holding apparatus. 3,603,635, Cl. 294-67.

Ifield, Richard Joseph, to Lucas, Joseph, (Industries) Limited. Fluid control apparatus. 3,603,086, Cl. 60-53.

Iida, Hirohiko; Kida, Kazuyoshi; and Taira, Koen, to Teijin Limited. Apparatus for false twisting. 3,603,068, Cl. 57-104.

Ikeda, Masachika: *See—*
Kinugawa, Masao; Ikeda, Masachika; and Tanaka, Yutaka,3,603,727.

Illinois Cereal Mills, Inc.: *See—*
Bess, Roscoe M., 3,603,365.

Illinois Tool Works, Inc.: *See—*
Huggins, James A., 3,603,311.

Imai, Keikichi; and Matsumoto, Sakuzo, to Olympus Optical Company, Ltd. Micrometer head. 3,602,998, Cl. 33-170.

IMC Magnetics Corporation: *See—*
Saretzky, Simon, 3,603,826.

Imperial Chemical Industries Limited: *See—*
Neilson, William, 3,603,426.

Inariba, Tokuzo: *See—*
Terada, Kinji; Inariba, Tokuzo; Hiraiwa, Atsumu; and Taniguchi, Takeshi,3,603,073.

Industria Calza Toscana Benvenuti & Morelli SNC: *See—*
Turini, Francesco, 3,603,116.

Industrial Magnetics, Inc.: *See—*
Peacock, George Raymond, 3,603,759.

Ingersoll-Rand Company: *See—*
Dresher, Seymour, 3,603,224.

Ingleright, Paul T., to Strausberg & Son Co. Apparatus and methods for forming a joint between adjacent paving mats. 3,603,223, Cl. 94-39.

Ingram, Carl B.; and Watson, Louis E. Roll type field irrigation device with weight self- aligning riser outlet and automatic drain units. 3,603,508, Cl. 239-111.

Inland Steel Company: *See—*
Coppens, Mattheus J. M., 3,603,476.

International Business Machines Corporation: *See—*
Attwood, Dennis P.; Syme, David M.; and Tuffill, Harold W., 3,603,936.
Badum, Paul J.; and Nejezchleb, Vladimir, 3,603,943.
Barbeau, Raymond A.; and Wroblewski, Edward J., 3,602,940.
Cooper, Thomas S., 3,603,938.
Garnache, Richard R., 3,603,284.
Grubel, Stanley J.; La Rou, Joseph E.; and Stirling, Hugh R., 3,603,897.
Harris, Thomas J.; Kosanke, Kurt M.; Kulcke, Werner W.; and Max, Erhard, 3,603,801.
Heath, Harold F., Jr.; and Husson, Samir S., 3,603,934.
Heidecker, Robert F., 3,603,942.
Hertrich, Friedrich R., 3,603,945.
Leoff, Arkady, 3,603,646.
Loizides, Edward; and Steigerwalt, George F., 3,603,937.
Schuenemann, Claus H., 3,603,820.
Weinberger, Arnold, 3,603,776.

International Patents & Development Corporation: *See—*
Price, Howard; and Wallick, Seymour, 3,603,247.
Price, Howard; and Szilagyi, Bela, 3,603,564.

International Standard Electric Corporation: *See—*
Ash, Bernard Edwin, 3,603,842.
Weber, Josef, 3,603,907.

International Telephone and Telegraph Corporation: *See—*
Erdmann, Hans, 3,603,613.
Fling, John J., 3,604,002.
Schlitz, Erwin, 3,603,158.
Witte, Robert A., 3,603,987.

Interprinderea Montaje Conducte Magistrale: *See—*
Teodorescu, Gheorghe Marcel, 3,603,464.

Inventions Finance Corporation: *See—*
Nouel, Robert Ange Marie, 3,603,248.

Io, Kenji: *See—*
Hirota, Masao; Nakarai, Kazumi; Io, Kenji; Tanaka, Keiji; and Matsuda, Katsuji,3,603,643.

Ireland, John W.; and Holloway, James C., to Bunker-Ramo Corporation, The. Thin-film resistor adjustment. 3,603,768, Cl. 219-499.

Irie, Yoshihiko; Nishizawa, Mitsunori; and Yamawaki, Shunro, to Tokico Ltd. Fuel supplying apparatus. 3,603,480, Cl. 222-20.

Ironees Company, The: *See—*
Lehrman, David, 3,603,367.

Isett, Donald D.; and Lomax, John W., to Texas Instruments, Incorporated. Input/output signal point assignment. 3,603,771, Cl. 235-151.

Isley, William C.; and Lund, William C., to United States of America, National Aeronautics and Space Administration, The. Heated porous plug micro thrustor. 3,603,093, Cl. 60-260.

Jackman, Robert M.; and McDonald, William N., to A. O. Smith-Inland Inc., mesne. Spigot forming tool. 3,603,182, Cl. 82-4.

Jacobsen Manufacturing Company: *See—*
Heth, Sherman C., 3,603,008.

Jaeger, Raymond E.: *See—*
Gyorgy, Ernst M.; Jaeger, Raymond E.; and Seidel, Harold,3,603,899.

Jakopic, Erich. One-or multi-steps compressing ionic pump. 3,603,703, Cl. 417-48.

James, Norman J. Telescope mounting system. 3,603,664, Cl. 350-83.

Jameson, Stanley R.: *See—*
Brilando, Frank P.; and Jameson, Stanley R.,3,603,549.

Jaskulski, Manfred Erich; Ruger, Gerd Heinz; and Wunsch, Wolfgang Kurt, to VEB Nakwirkmaschinebau Malimo Karl-Marx-Stadt. Warp-knitting machine. 3,603,114, Cl. 66-85.

Jayne, Max L.; and Pihlblad, Robert W., to Sylvania Electric Products, Inc. Means for polarizing a connector assembly. 3,603,915, Cl. 339-186.

Jegco Inc.: *See—*
Maxwell-Stewart, John P., 3,603,034.

Jenkins, George O., Company: *See—*
MacArthur, Daivd James; and Reed, Lawrence S., Jr., 3,602,931.

Jensen, Kenneth W. Ejected shell retainer. 3,603,015, Cl. 42-1.

Jensen, Richard C., to Carrier Corporation. Rotor assembly. 3,603,702, Cl. 416-220.

Jered Industries, Inc.: *See—*
Davies, Edward R.; and Gregory, Charles E., 3,603,561.

Johnson, Allen L., to Ripley Company, Inc. Monitoring system. 3,603,968, Cl. 340-336.

Johnson, Caldwell C., to United States of America, National Aeronautics and Space Administration. Stand-off type ablative heat shield. 3,603,260, Cl. 102-105.

Johnson, Gary R.: *See—*
Kammerer, Archer W., Jr.; and Johnson, Gary R.,3,603,412.

Johnson, George L., to Sanders Associates, Inc. Pulse density demodulator. 3,603,988, Cl. 343-5.

Johnson, George R., to Arpax Company, The. Method for producing cushioning dunnage. 3,603,216, Cl. 93-1.

Johnson, James E., to Construction Machinery Company. Support frame for a concrete mixer truck. 3,603,565, Cl. 259-176.

Johnson, James J.: *See—*
Carella, Richard F.; and Johnson, James J.,3,603,636.

Johnson, Paul J. Automatic battery charger. 3,603,860, Cl. 320-2.

Johnson, Robert E.: *See—*
Paine, T. O., Administrator of the National Aeronautics and Space Administration with respect to an invention of,; Wyman, Charles L.; Gould, John M.; Johnson, Robert E.; and Weiss, Paul F.,3,603,686.

Johnson Service Company: *See—*
Lederman, Warren A.; and Petrie, Charles N., 3,603,335.

Johnson, William B.: *See—*
Case, John S.; and Johnson, William B.,3,603,288.

Johnston, Arch D.: *See—*
Saylak, Donald; and Johnston, Arch D.,3,603,142.

Jones, Dallas W., to United States of America, Navy. Pulse analyzer. 3,603,888, Cl. 328-112.

Jones, Durward B., to Offshore Systems Inc. Method and apparatus for removably coupling a blowout preventer stack to an underwater wellhead casing. 3,603,385, Cl. 166-0.5

Jones, Milton O.: *See—*
Elliott, Aldelbert J.; and Jones, Milton O.,3,603,107.

Jones, Richard B., to Perfect Film & Chemical Corporation. Cassette camera. 3,603,232, Cl. 95-31.

Joyce-Cridland Company, The: *See—*
Hott, Ion V. K.; and Haddix, Robert J., 3,603,609.

Jungner Instrument Aktiebolaget: *See—*
Kihlberg, Gunnar Axel, 3,603,777.

Jureit, John Calvin; and Csakvary, Oscar, to Automated Building Components, Inc. Fabricating apparatus for wooden trusses, panels, and the like. 3,603,244, Cl. 100-48.

Jurid Werke G.m.b.H.: *See—*
Thomas, Carl, 3,602,953.

Justrite Mfg., Co.: *See—*
Keller, Nicholas W., 3,603,343.

Juzvenko, Jury Arsenievich; Lanina, Tamara Vladimirovna; Shimanovsky, Vasily Pavlovich; Gavrish, Vasily Antonovich; Paschenko, Mark Antonovich; Melnik, Alexandr Vasilievich; Zhurkovsky, Igor Sergeevich; and Vaksin, Moisei Isaakovich. Electrode for building up of steel articles. 3,603,763, Cl. 219-146.

Kaar, James L. Foot operated bass stringed musical instrument. 3,603,192, Cl. 84-173.

Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
Eilhardt, Bernd; and Ziemek, Gerhard Karl, 3,603,715.
Urbigkeit, Walter; Baumann, Karl P. G.; and Ahrens, Guenter, 3,602,960.

Kabelschlepp GmbH: *See—*
Loos, Kurt; and Haschek, Friedrich, 3,603,373.

Kabushiki Kaisha Ichikin Kogyosha: *See—*
Kawaguchi, Yukiyoshi, 3,603,119.
Kawaguchi, Yukiyoshi, 3,603,135.
Kabushiki Kaisha Ricoh: *See—*
Kiruma, Kenji, 3,603,200.
Kadowaki, Tatsusuke, 3,603,677.
Kasuya, Shozo, 3,603,289.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Terada, Kinji; Inariba, Tokuzo; Hiraiwa, Atsumu; and Taniguchi, Takeshi, 3,603,073.
Kadowaki, Tatsusuke, to Kabushiki Kaisha Ricoh. Cineprojector. 3,603,677, Cl. 352-124.
Kaffel, Michael. Picture frame structure. 3,603,627, Cl. 287-189.36
Kahn, Peter Bruno, to Screws, G.K.M., & Fasteners Limited, and Plessey Company Limited, The. Explosive operated power tool with impact and rotation. 3,603,406, Cl. 173-108.
Kaiser Aluminum & Chemical Corporation: *See—*
Abboud, Harry I.; and Furnish, Oren C., 3,603,569.
Kaldenberg, Henry J., to Maytag Company, The. Dishwasher door seal. 3,603,035, Cl. 49-485.
Kalnishevsky, Vladimir Konmunarovich: *See—*
Khrenov, Konstantin Konstantinovich; Chudakov, Vyacheslav Andreevich; Strogenov, Konstantin Vasilievich; Kleiman, Vladimir Leonidovich; Fishkis, Mikhail Mironovich; Nikolaev, Vyacheslav Mikhailovich; Kalnishevsky, Vladimir Konmunarovich; and Maltsev, Boris Mikhailovich,3,603,760.
Kamata, Masamoto: *See—*
Arimura, Tohru; Kamata, Masamoto; Saito, Morio; and Okamoto, Terumi,3,603,124.
Kammerer, Archer W., Jr.; and Johnson, Gary R., to Baker Oil Tools, Inc. Method and apparatus for drilling in casing from the top of a bore hole. 3,603,412, Cl. 175-260.
Kannari, Takehiko: *See—*
Okano, Tohei; and Kannari, Takehiko,3,603,448.
Kansas University Endowment Association, The: *See—*
Moore, Richard K., 3,603,919.
Kapan, Joseph. Intermittent movement mechanism. 3,603,168, Cl. 74-394.
Kasper, Bernhard O. A.; and Rombach, Friedrich, to National Cash Register Company, The. Automatic machine control device. 3,603,503, Cl. 235-7.
Kassel, Philip. Radar system. 3,603,998, Cl. 343-12.
Kast, Howard B.; and Buckley, Bruce S., to General Electric Company. Gain compensating control component. 3,603,338, Cl. 137-83.
Kasuya, Shozo, to Kabushiki Kaisha Ricoh. Electrostatic latent image developing apparatus. 3,603,289, Cl. 118-637.
Katrak Vehicle Co.: *See—*
Schoonover, Richard H. A., 3,603,423.
Kaut, George A., to Goodyear Tire & Rubber Company, The. Molding apparatus and process. 3,602,949, Cl. 18-39.
Kawaguchi, Yukiyoshi, to Kabushiki Kaisha Ichikin Kogyosha. Apparatus for heat treatment of fabric. 3,603,119, Cl. 68-50.
Kawaguchi, Yukiyoshi, to Kabushiki Kaisha Ichikin Kogyosha. Apparatus for continuous measuring the moisture content in a high temperature chamber at atmospheric pressure. 3,603,135, Cl. 73-29.
Kay, Charles, to Christy, J. Raymond, Enterprises, Inc. Structural building system. 3,603,060, Cl. 52-281.
Kayser, John P.: *See—*
Spradling, Joseph W.; and Kayser, John P.,3,603,308.
Kazuk, Walter F.: *See—*
Gallaro, Anthony V.; Kazuk, Walter F.; and Speigel, Kenneth,3,603,792.
Gallaro, Anthony V.; Kazuk, Walter F.; and Speigel, Kenneth,3,603,830.
Kdi Holex Incorporated: *See—*
Grinnell, Stuart W.; and Flagg, Robert F., 3,602,952.
Keathley, William H.; and Wesselski, Clarence J., to United States of America, National Aeronautics and Space Administration. Low onset rate energy absorber. 3,603,433, Cl. 188-1.
Keller, Nicholas W., to Justrite Mfg., Co. Drum vent valve. 3,603,343, Cl. 137-493.6
Keller, Thomas C.; and Gegenheimer, Louis H., to Tinken Company, The. Bearing assembly. 3,603,655, Cl. 308-180.
Kellerman, David. Wound capacitor terminal connection arrangement. 3,603,849, Cl. 317-260.
Kelley, George P. Disposable film developing sleeve. 3,603,237, Cl. 95-90.
Kelley, Oliver K., to General Motors Corporation. Adjustable drive pivot mounting for windshield wiper. 3,602,937, Cl. 15-250.
Kelley, William D. Golf game. 3,603,594, Cl. 273-176.
Kelly, William E., to Thomas & Betts Corporation. Raceway terminator. 3,603,912, Cl. 339-89.
Kendall, Robert T.; and Tanibata, Robert S. Pressure relief impact absorbing apparatus. 3,603,430, Cl. 182-137.
Kenney, Bernard D. Dental device and process using it to make jackets and fixed bridgework. 3,602,993, Cl. 32-17.
Kenrick & Jefferson Limited: *See—*
Elsworth, John F.; Atkins, Barry; and Sever, Bernard P., 3,603,251.
Kerr, Douglas A.; and Kolodner, Bernard B., to Bell Telephone Laboratories, Incorporated. Party line stations for selective calling systems. 3,603,932, Cl. 340-147.
Khimich, Georgy Lukich; Niskovskikh, Vitaly Maximovich; Varaxin, Alexei Ivanovich; Gelfenbein, Evgeny Jukhimovich; and Bykov, Vladimir Alexandrovich. Curvilinear mold and secondary cooling system for continuously cast metal. 3,603,377, Cl. 164-282.
Khrenov, Konstantin Konstantinovich; Chudakov, Vyacheslav Andreevich; Strogenov, Konstantin Vasilievich; Kleiman, Vladimir Leonidovich; Fishkis, Mikhail Mironovich; Nikolaev, Vyacheslav Mikhailovich; Kalnishevsky, Vladimir Konmunarovich; and Maltsev, Boris Mikhailovich. Apparatus for effecting the magnetic-impulse welding and pressure working of metals, preferable for welding tubular-shaped parts. 3,603,760, Cl. 219-10.79
Kickbusch, Ernst. Supercharged internal combustion engine, particularly supercharged Diesel engine for vehicular drives. 3,603,079, Cl. 60-13.
Kida, Kazuyoshi: *See—*
Iida, Hirohiko; Kida, Kazuyoshi; and Taira, Koen,3,603,068.
Kidde, Walter, & Co., Inc.: *See—*
Wellhofer, Carl, 3,603,784.
Kihlberg, Gunnar Axel, to Jungner Instrument Aktiebolaget. Method and apparatus for generating an electrical signal, representing a value of a function of an independent variable. 3,603,777, Cl. 235-197.
Kilgore, Marion D.: *See—*
Current, James H; Ehlert, Harry C.; and Kilgore, Marion D.,3,603,388.
Killey, Lloyd W. Garment finisher. 3,603,490, Cl. 223-70.
Kim, Sangbong. Directional panel adapted to control the passage of incident radiation. 3,603,670, Cl. 350-260.
Kimberly-Clark Corporation: *See—*
Burger, William H., 3,602,965.
Kimmel, Hermann. Radiation detector with gas permeable, radiation window. 3,603,831, Cl. 313-93.
Kimura, Jack A., to Bendix Corporation, The. Master cylinder fluid level indicator. 3,603,926, Cl. 340-59.
Kindler, Rolf H., to Square D Company. One-piece clip and load side terminal strap. 3,603,916, Cl. 339-217.
King, Kenneth J. Boat-centering and guiding device for boat trailers. 3,603,465, Cl. 214-84.
King, Ralph J.: *See—*
Hubbs, Charles H., 3,603,506.
Kingsley, Charles R.; Kohler, John C.; Lehmann, Robert P.; and Ulmschneider Laurence A., to Eastman Kodak Company. Casing for storing a strip of photographic film. 3,603,528, Cl. 242-197.
Kinkead, Alfred Norman, to United Kingdom Atomic Energy Authority. Devices for estimating the stress in concrete structures. 3,603,141, Cl. 73-88.
Kino, Yoshihiro; and Nakayama, Yasuhiko, to Matsushita Electric Industrial Company, Limited. Arc-image zone-refining furnace. 3,603,766, Cl. 219-349.
Kinugawa, Masao; Ikeda, Masachika; and Tanaka, Yutaka, to Matsushita Electric Industrial Co., Ltd., and Matsushita Graphic Communication Systems Inc. Variable scale scanning system for image reproduction. 3,603,727, Cl. 178-6.7
Kirkpatrick, George A. Dolly for handling long heavy objects. 3,603,608, Cl. 280-47.13
Kirschner, John G., to Mallory, P. R., & Co. Inc. Ceramic capacitor with counter-electrode. 3,603,850, Cl. 317-261.
Kishigami, Takaya, to Gakken Co., Ltd. Fabricating toys. 3,603,026, Cl. 46-26.
Kleiman, Vladimir Leonidovich: *See—*
Khrenov, Konstantin Konstantinovich; Chudakov, Vyacheslav Andreevich; Strogenov, Konstantin Vasilievich; Kleiman, Vladimir Leonidovich; Fishkis, Mikhail Mironovich; Nikolaev, Vyacheslav Mikhailovich; Kalnishevsky, Vladimir Konmunarovich; and Maltsev, Boris Mikhailovich,3,603,760.
Kleitman, David: *See—*
Camenzind, Hans Rudolph; Grebene, Alan Bebin; and Kleitman, David,3,603,890.
Kleywegt, Jacob: *See—*
Hylbert, Edgar W.; Tomaszewski, Bernd F. O.; Kleywegt, Jacob; and Dietl, Hans,3,603,370.
Klinger, Yehuda: *See—*
Koren, Heiman W.; Worontzoff, Nicolas; Siegel, Kenneth; and Klinger, Yehuda,3,603,716.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Decker, Hanns; and Stockmann, Helmut, 3,603,516.
Knabusch, Edward M.; and Shoemaker, Edwin J., to La-Z-Boy Chair Company. Office type chair. 3,603,641, Cl. 297-300.
Kneisley, Robert R. Commode, storage apparatus or the like. 3,602,924, Cl. 4-142.
Knudsen, David S., to McKenna Equipment Company, Inc. Marking device. 3,603,250, Cl. 101-36.
Kobayashi, Tatsuo; Fujii, Yoshifusa; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Foldable strobo discharge flash system. 3,603,781, Cl. 240-1.3
Koehring Company, Incorporated: *See—*
Parrett, John T., 3,603,207.
Koett, Albert C. Pierce nut fastening means and method. 3,602,974, Cl. 29-243.5
Kohler, John C.: *See—*
Kingsley, Charles R.; Kohler, John C.; Lehmann, Robert P.; and Ulmschneider Laurence A.,3,603,528.
Kohnke, Richard Fallschirmwerk: *See—*
Dochow, Heinz, 3,603,536.

Koji, Alex I.: *See—*
McGregor, Eugene R.; and Koji, Alex I.,3,603,638.
Kollen, George P., to United Engineering and Foundry Company. Rotary plate slitting shear. 3,603,190, Cl. 83-499.
Kolodner, Bernard B.: *See—*
Kerr, Douglas A.; and Kolodner, Bernard B.,3,603,932.
Konkol, Timothy, to Gradko Glass Laboratories, Inc. Disposable dilution system. 3,603,156, Cl. 73-425.4
Kooi, Else, to U.S. Philips Corporation, mesne. Method of manufacturing a semiconductor device and semiconductor device obtained by carrying out said method. 3,602,981, Cl. 29-571.
Kooi, Else, to U.S. Philips Corporation, mesne. Method of manufacturing a semiconductor device and device manufactured by said method. 3,602,982, Cl. 29-577.
Koorneef, Jacob, to U.S. Philips Corporation, mesne. Combination of two or more shielded magnetic heads having at least one writing head and at least one reading head. 3,603,941, Cl. 340-174.1
Kopp, Manfred K.: *See—*
Borkowski, Casimer J.; and Kopp, Manfred K.,3,603,797.
Koppers Company, Inc.: *See—*
Reinfeld, Kurt; and Goyue, Emmanuel V., 3,603,376.
Rosenstern, Franz J., 3,603,572.
Koren, Heiman W.; Worontzoff, Nicolas; Siegel, Kenneth, deceased (by Siegel, Bernice, executrix); and Klinger, Yehuda, to United States of America, Army, mesne. Superconducting R. F. radiation shield for high Q circuits. 3,603,716, Cl. 174-35.
Kosakowski, Henry R.: *See—*
Van Winkle, Edgar W.; Kosakowski, Henry R.; and Hollinger, Walter P.,3,603,980.
Kosakowski, Henry, to Bendix Corporation, The. Digital system including temperature compensating means. 3,603,979, Cl. 340-347.
Kosanke, Kurt M.: *See—*
Harris, Thomas J.; Kosanke, Kurt M.; Kulcke, Werner W.; and Max, Erhard,3,603,801.
Kotz, Christian Peter: *See—*
Brandt, Heinrich Peter, 3,603,420.
Kotz, Fritz: *See—*
Brandt, Heinrich Peter, 3,603,420.
Kowalski, Daniel C.: *See—*
Dheridon, Nicholas K.; and Kowalski, Daniel C.,3,603,682.
Krasin, Lester Q.; and Greene, Clifford E., to Superior Continental Corporation, mesne. Line tap unit for telephone system. 3,603,744, Cl. 179-170.8
Kremp, Rudolf; Friedlaender, Ernst; and Winkler, Alfred, to Agfa-Gevaert Aktiengesellschaft. Camera release means. 3,603,228, Cl. 95-11.
Kremp, Rudolf; and Winkler, Alfred, to Agfa-Gevaert Aktiengesellschaft. Film metering mechanism. 3,603,233, Cl. 95-31.
Kretchman, Gerald L.: *See—*
Reznicek, Raymond A.; Kretchman, Gerald L.; and Stone, Samuel E.,3,603,648.
Krosoczka, Joseph D.: *See—*
Merrill, Samuel E.; and Krosoczka, Joseph D.,3,603,560.
Kroutil, Joseph: *See—*
Esker, Donald W.; and Kroutil, Joseph,3,603,089.
Krugler, Allen D., Jr., to Ford Motor Company. Integrating accelerometer. 3,603,157, Cl. 73-503.
Krysiak, Joseph E.: *See—*
Buzzard, Wallace C.; and Krysiak, Joseph E.,3,603,435.
Krystal, Joseph. . 3,602,918, Cl. 2-197.
Kukuminato, Testuo: *See—*
Nakata, Yoshihiro; and Kukuminato, Testuo,3,603,620.
Kula, Frank C.: *See—*
Patchen, Paul J.; and Kula, Frank C.,3,603,174.
Kulbersh, Irwin R.: *See—*
Ferdinand, Irwin J.; and Kulbersh, Irwin R.,3,603,274.
Kulcke, Werner W.: *See—*
Harris, Thomas J.; Kosanke, Kurt M.; Kulcke, Werner W.; and Max, Erhard,3,603,801.
Kull, Edward A.: *See—*
LaPierre, Arthur W.; and Kull, Edward A.,3,603,511.
Kumpf, Hermann, to Siemens Aktiengesellschaft. Centering device for nuclear reactor loading machines. 3,603,634, Cl. 294-86.
Kurtin, Stephen L.; and Mead, Carver A. Disposable body temperature sensor. 3,603,150, Cl. 73-362.
Kuster, Josef; and Broll, Josef, to Benz & Hilgers GmbH. Appaaus for separation and transporting containers stacked up into each other. 3,603,479, Cl. 221-210.
Kysor Industrial Corporation: *See—*
Pioch, Robert J., 3,603,245.
Kytta, Oswald O., to Bendix Corporation, The. Servomotor having a one piece center plate. 3,603,208, Cl. 91-376.
La-Z-Boy Chair Company: *See—*
Knabusch, Edward M.; and Shoemaker, Edwin J., 3,603,641.
La Beroche SA: *See—*
Wyss, Andre, 3,602,927.
Lacock, James A.: *See—*
Schmidt, Kenneth J.; and Lacock, James A.,3,603,418.
Laessker, Fritz B., to Sybron Corporation. Articulated headrest for dental chairs and the like. 3,603,642, Cl. 297-408.
La Grouw, Johannes: *See—*
Van Loghem, Johannes Jacobus; and La Grouw, Johannes,3,603,053.
Lai, Kow-Fat; and Lietar, Christian, to Pailand S.A. Variable focus objective. 3,603,669, Cl. 350-186.
La Iacona, Felix P., to United States of America, National Aeronautics and Space Administration. Bonding of reinforced teflon to metals. 3,602,979, Cl. 29-473.1
Laird, William F., to General Motors Corporation. Cooled seal. 3,603,599, Cl. 277-53.
Lamperti, Enrico. Rotating distributor device seated within the cylinder head for endothermic tow-or four-stroke- cycle or diesel engines. 3,603,299, Cl. 123-190.
Lampman, William T., to Whirlpool Corporation. Dishwasher. 3,603,696, Cl. 415-126.
Lane, Arthur H., to Dowty Rotol Limited. Engine, propeller and rotor installations. 3,603,697, Cl. 416-33.
Lane, George H.: *See—*
Bracken, Pat O.; and Lane, George H.,3,603,951.
Lang, Ronald E.: *See—*
Thurston, Raymond L.; and Lang, Ronald E.,3,602,975.
Langweiler, Frank: *See—*
Neuffer, Ingemar; Eichmann, Dieter; and Langweiler, Frank,3,603,869.
Lanina, Tamara Vladimirovna: *See—*
Juzvenko, Jury Arsenievich; Lanina, Tamara Vladimirovna; Shimanovsky, Vasily Pavlovich; Gavrish, Vasily Antonovich; Paschenko, Mark Antonovich; Melnik, Alexandr Vasilievich; Zhurkovsky, Igor Sergeevich; and Vaksin, Moisei Isaakovich,3,603,763.
LaPierre, Arthur W.; and Kull, Edward A., to Monsanto Company. Heat seated anchorable perforated hose. 3,603,511, Cl. 239-450.
La Rou, Joseph E.: *See—*
Grubel, Stanley J.; La Rou, Joseph E.; and Stirling, Hugh R.,3,603,897.
Latincisics, Nandor K.: *See—*
Snow, Frederick O., III.; Connelly, Francis X.; Glazer, Harold; and Latincisics, Nandor K.,3,603,449.
Laufer, Helmut, to Dual Gebruder Steidinger. Pile axle. 3,603,598, Cl. 274-10.
Lauterbach, William L., to United States Steel Corporation. Flexible starter bar for continuous castings. 3,603,375, Cl. 164-274.
Layman, John D., to General Electric Company. Pulse generator system responsive to spindle motor rotational phase signal for providing digital pulses at rate dependent upon motor speed. 3,602,994, Cl. 328-134.
Leach, Charles E.: *See—*
Allen, Charles H.; and Leach, Charles E.,3,603,415.
Leber, William: *See—*
Anderson, Lloyd E., Sr.; Harper, George C.; Leber, William; and Miller, Charles G.,3,603,204.
Lechner, Bernard Joseph, to RCA Corporation. Color display for computer terminal. 3,603,962, Cl. 340-324.
Lecinski, Frank H., Jr.; and Westfall, James E., to Continental Can Company. Transferable finish ring and container and closure for use therewith. 3,603,472, Cl. 215-40.
Lederman, Warren A.; and Petrie, Charles N., to Johnson Service Company. Impacting stream fluidic logic device with nono- nonostable response. 3,603,335, Cl. 137-81.5
Le Dorh, Maurice F.; Le Goffic, Yves H.; and Arnouat, Fernand R. Call system for time-division, delta-code switching network. 3,603,737, Cl. 179-15.
Ledoux, Claude: *See—*
Neuville, Bernard; Ledoux, Claude; and Hess, Raoul,3,602,943.
Lee, Charles Allen; and Wagner, Joseph Robert, to Huyck Corporation. Apparatus for use on papermaking machines. 3,603,354, Cl. 139-383.
Lee, Robert D., to United States of America, National Aeronautics and Space Administration. Telemetry-actuated switch. 3,603,946, Cl. 340-177.
Le Goffic, Yves H.: *See—*
Le Dorh, Maurice F.; Le Goffic, Yves H.; and Arnouat, Fernand R.,3,603,737.
Lehman, Ira S. Abdominal belt. 3,603,316, Cl. 128-546.
Lehmann, Robert P.: *See—*
Kingsley, Charles R.; Kohler, John C.; Lehmann, Robert P.; and Ulmschneider Laurence A.,3,603,528.
Lehrman, David, to Ironees Company, The. Collapsible hamper. 3,603,367, Cl. 150-49.
Leinhauser, Joe Paul: *See—*
Burrough, Donald E.; and Leinhauser, Joe Paul,3,603,066.
Leitz, Ernst, G.m.b.H.: *See—*
Hock, Fromund, 3,603,687.
Lejeune, Daniel, to Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie. Vulcanization press. 3,602,948, Cl. 18-17.
Lejeune, Daniel, to Compagnie Generale des Etablissements Michelin raison sociale Michelin & Cie. Flexible tubes having inner sheath serving as mandrel for outer sheath and method of making same. 3,603,719, Cl. 174-47.
Leoff, Arkady, to International Business Machines Corporation. Semiconductor wafer air slide with controlled wafer motion. 3,603,646, Cl. 302-29.
Leonard, Louis H., Jr., to Carrier Corporation. Heating and cooling system. 3,603,379, Cl. 165-2.
Leroux, Roger, to Societe Anonyme D. B. A. Disc for a disc brake. 3,603,434, Cl. 188-73.6
Leschisin, John, to Hypro, Inc. Expanded piston cup and improved spreader. 3,603,215, Cl. 92-182.

Levy, Donald; and Rusz, Tibor, to Donti Research Development Manufacturing Corporation. Minute volume alarm equipment. 3,603,955, Cl. 340-239.
Lewicki, George W.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,603,892.
Lewin, Gunnar Erik Werner, to AB Lyckeaborgs Bruk. Caster wheel arrangement. 3,602,941, Cl. 16-21.
Lewis Engineering Company: *See—*
Horwinski, Elwood R., 3,603,403.
Lewis, Peter, to Miner Industries, Inc. Kaleidoscope. 3,603,663, Cl. 350-4.
Lewis, Richard L.: *See—*
Mac Duff, Stanley I.; and Lewis, Richard L.,3,603,209.
Licencia Talalmanyokat Ertekesito Vallalat: *See—*
Szabo, Gyorgy; and Toth, Sandor, 3,602,944.
Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Detert, Klaus; Lipp, Hans-Jochen; and Winschuh, Erich, 3,603,143.
Liebenthal, Benjamin C., to General Motors Corporation. Electronic analog for an electromechanical relay. 3,603,865, Cl. 321-47.
Lietar, Christian: *See—*
Lai, Kow-Fat; and Lietar, Christian,3,603,669.
Lind, Willard M., to FMC Corporation. Apparatus for aligning forms. 3,603,557, Cl. 249-192.
Lindberg, John E.; McCoy, Darrel V.; Schanck, Gordon J.; and Van Cleef, Harry E., Jr., said McCoy said Schanck and said Van Cleef assors. to said Lindberg. Fire detector circuit. 3,603,953, Cl. 340-228.
Lindley, Dale C., to Textron Inc. Binary phase-scanning antenna with diode controlled slot radiators. 3,604,012, Cl. 343-768.
Lindsay, Edward W., to Vacu-Maid, Inc. Vacuum system for removing water from synthetic turf. 3,602,938, Cl. 15-314.
Lingl, Hans M. L., Jr., to Lingl-Bell Corporation. Method for unloading and blending layered stacks of bricks or similar articles. 3,603,466, Cl. 214-152.
Lingl, Johann. Apparatus for producing bricks. 3,602,963, Cl. 25-105.
Lingl-Bell Corporation: *See—*
Lingl, Hans M. L., Jr., 3,603,466.
Link, Howard D., to Christensen Diamond Products Company. Retractable drill bits. 3,603,411, Cl. 175-259.
Link, Howard D.: *See—*
Grill, Werner K.; and Link, Howard D.,3,603,413.
Lins, Stanley J.: *See—*
Carpentier, Frank J.; and Lins, Stanley J.,3,603,756.
Lipp, Hans-Jochen: *See—*
Detert, Klaus; Lipp, Hans-Jochen; and Winschuh, Erich,3,603,143.
Lissaman, Peter B. S.: *See—*
Burke, Richard J.; and Lissaman, Peter B. S.,3,603,537.
Little, Robert E., to Arvin Industries, Inc. Electric scissors blades. 3,602,988, Cl. 30-228.
Litton Business Systems Inc.: *See—*
McLean, Ronald H., 3,603,443.
Litton Industries, Inc.: *See—*
Price, Ralph E., 3,603,044.
LNG Services, Inc.: *See—*
Petsinger, Robert E., 3,603,822.
Lochridge, Joe C., to Brown & Root, Inc. Method and apparatus for making submerged conduit connections. 3,603,617, Cl. 285-24.
Lockheed Aircraft Corporation: *See—*
Hamilton, Ralph A., 3,603,691.
Hasty, John M., Jr., 3,603,913.
Lockheed Missiles & Space Company: *See—*
Freier, Michael; and Balazer, Leonard P., 3,604,003.
Loewe, Richard, to Bosch, Robert, Photokino GmbH, mesne. Means for producing fade-in and fade-out effects on motion picture film. 3,603,676, Cl. 352-91.
Loffler, Gerhard: *See—*
Moos, Franz; and Loffler, Gerhard,3,603,256.
Logan, Ralph Andre; Rosenzweig, Walter; and Wiegman, William, to Bell Telephone Laboratories, Incorporated. Electroluminescent junction semiconductor with controllable combination colors. 3,603,833, Cl. 313-108.
Lohmann, Gunther; and Guminski, Alfons, to Luitpoldhutte Aktiengesellschaft. Fragmenting scrap metal. 3,603,515, Cl. 241-100.
Lohr & Bromkamp GmbH: *See—*
Aucktor, Erich; and Willimek, Walter, 3,603,111.
Lohr, Thomas E., to Allied Chemicals Corporation. Outside rear view mirror assembly. 3,603,555, Cl. 248-481.
Loizides, Edward; and Steigerwalt, George F., to International Business Machines Corporation. Multilevel compressed index generation method and means. 3,603,937, Cl. 340-172.5
Lomax, John W.: *See—*
Isett, Donald D.; and Lomax, John W.,3,603,771.
Loos, Kurt; and Haschek, Friedrich, to Kabelschlepp GmbH. Protective cover for guide paths of machine tools. 3,603,373, Cl. 160-202.
Lord, Jack: *See—*
Crane, Harold E.; and Lord, Jack,3,603,856.
Crane, Harold E.; and Lord, Jack,3,603,857.
L'Oreal:*See—*
Morane, Bruno; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert, 3,603,483.
Loskant, Winfried: *See—*
Adolff, Jurgen Martin; Heintschel-Heinegg, Egbert; and Loskant, Winfried,3,602,968.
Lu, Kenneth C. Artificial tree structure. 3,603,780, Cl. 240-10.
Lucas, Joseph, (Industries) Limited: *See—*
Baker, Alfred Dickens, 3,603,785.
Bertioli, Michael Murray; and Willington, David Everitt, 3,602,983.
Bloom, Joseph Lewis, 3,603,160.
Bottoms, Harry Simister, 3,603,342.
Bowcott, Roy Price, 3,603,803.
Cryer, Edward, 3,603,748.
Fry, William Lawrence; Royle, Antony Peter; and Darbyshire, Peter, 3,603,758.
Heath, Ronald Alfred, 3,603,337.
Hill, William Frank; and Phoenix, Lancelot, 3,603,612.
Ifield, Richard Joseph, 3,603,086.
Lucas, Paul A.; and Mottin, Ralph E., to Parke, Davis & Company. Disposable dispensing syringe vial. 3,603,312, Cl. 128-272.
Lucerne Products, Inc.: *See—*
Sahrbacker, Edward V., 3,603,757.
Lucifer S.A.: *See—*
Stampfli, Harald, 3,603,344.
Ludder, Rodney E., to Owens-Illinois, Inc., mesne. Method of making paper container having a high gloss exterior finish and wax coated interior and bottom surfaces. 3,603,218, Cl. 93-36.
Lude, Herman: *See—*
Stihl, Hans-Peter; Dolata, Hans; Sauermilch, Rolf; and Lude, Herman,3,603,179.
Ludwig, Klaus: *See—*
Scherbaum, Friedrich; and Ludwig, Klaus,3,603,381.
Luitpoldhutte Aktiengesellschaft: *See—*
Lohmann, Gunther; and Guminski, Alfons, 3,603,515.
Lumex, Inc.: *See—*
Murcott, Charles E.; and Salerno, Arthur, 3,602,929.
Lund, William C.: *See—*
Isley, William C.; and Lund, William C.,3,603,093.
Lussky, Frederic G., to Universal Oil Products Company. Large diameter framed structure. 3,603,051, Cl. 52-245.
Lutch, Robert H.: *See—*
Diamond, Milton J.; and Lutch, Robert H.,3,603,136.
Lutz, Adolf, to Huller, Karl, G.m.b.H. Borer seal. 3,603,600, Cl. 277-81.
Lutz, Dieter. Shock absorber for independent front wheel suspension. 3,603,574, Cl. 263-34.
Lutz, Manfred; and Schulz, Horst, to Fichtel & Sachs AG. Multiple speed bicycle hub with centrifugal governor. 3,603,178, Cl. 74-752.
M-B-W., Inc.: *See—*
Buck, Herman R., 3,603,225.
MacArthur, Daivd James; and Reed, Lawrence S., Jr., to Jenkins, George O., Company. Felted, fibrous, thermoplastic sheet fibreboard for molding rigid shoe components and method of making the same and making said components therefrom. 3,602,931, Cl. 12-146.
Mac Duff, Stanley I.; and Lewis, Richard L., to Bendix Corporation, The. Hydraulic brake booster. 3,603,209, Cl. 91-391.
Mackay, Anthony J. R., 1/3 to Aambeeld, N.V. Control system for differential supercharger. 3,603,853, Cl. 318-146.
MacLean-Fogg Lock Nut Co.: *See—*
Grube, William L., 3,602,976.
Schwiebert, Phillip D.; and Norinder, Ivar H., 3,603,078.
Mac Lean-Fogg Lock Nut Co.: *See—*
Schwiebert, Phillip D., 3,603,267.
MacNamara, Francis Peter: *See—*
Billinger, Brian Arthur; MacNamara, Francis Peter; and Cooper, George Samuel,3,603,090.
Mac Neill, John H.: *See—*
Ward, Leonard G.; and Mac Neill, John H.,3,603,442.
Maeda, Teruo; and Miyata, Susumu, to Nissan Jidosha Kabushiki Kaisha. Independent suspension device for suspending automobile wheels. 3,603,421, Cl. 180-73.
Magnavox Company, The: *See—*
Dreisbach, Robert H., 3,603,921.
Magni, Ambrogio. Guarantee cap. 3,603,469, Cl. 215-6.
Maier, Werner. Inflatable bandage for blood-pressure gauge. 3,603,304, Cl. 128-2.05
Malcolm, Donald H., to Bio Data, Inc. Rate detecting apparatus. 3,603,769, Cl. 235-92.
Mallindine, James L. Equipment for dispensing liquids from a container. 3,603,358, Cl. 141-98.
Mallory, P. R., & Co. Inc.: *See—*
Hirsch, James A.; and Sheldon, Robert F., 3,603,852.
Kirschner, John G., 3,603,850.
Maloney, William R.; and Hallquist, Arthur L., to Addressograph-Multigraph Corporation. Photoelectrostatic print-out machine. 3,603,585, Cl. 271-57.
Maltsev, Boris Mikhailovich: *See—*
Khrenov, Konstantin Konstantinovich; Chudakov, Vyacheslav Andreevich; Strogenov, Konstantin Vasilievich; Kleiman, Vladimir Leonidovich· Fishkis, Mikhail Mironovich; Nikolaev, Vyacheslav Mikhailovich; Kalnishevsky, Vladimir Konmunarovich; and Maltsev, Boris Mikhailovich,3,603,760.
Manabe, Yoshikane, to Fujiki Kousan Kabushiki Kaisha. Internal grinder for steel ingot mould. 3,603,038, Cl. 51-35.

Manary, Leslie R.; and Frederick, Alexander E. Speed control for boats. 3,603,277, Cl. 114-145.

Manetti, Fred P.; and Miller, George H., to American Plasticraft Company. Electron tube arc-over ring with venting means. 3,603,914, Cl. 339-143.

Manley, Brian William; Schagen, Pieter; and Adams, John, to U.S. Philips Corporation, mesne. Image intensifier with channel-type secondary emission multiplier. 3,603,832, Cl. 313-95.

Mann, Freeman M., Jr.; and Carpenter, James H., Jr., to Carborundum Company, The. Workpiece treating system. 3,603,037, Cl. 51-14.

Mann, Henry: *See—*
Heick, Robert B.; and Mann, Henry,3,603,746.

Mann, Henry, to Bell Telephone Laboratories, Incorporated. Measurement of average duty cycle. 3,603,745, Cl. 179-175.2

Mann, Wayne Melvin. High speed ground transportation vehicle. 3,603,261, Cl. 104-23.

Marasso, Fred D.: *See—*
Carnes, Roy W.; Marasso, Fred D.; and Rademacher, Robert E.,3,603,059.

Marathon Oil Company: *See—*
Son, Marion O., Jr., 3,603,400.

March, Adrian Anthony Cecil. Fixing devices for structural members and cladding. 3,603,622, Cl. 287-20.927

Marconi Company Limited, The: *See—*
Dawson, John Howard; and Fripp, David George Francis, 3,603,898.

Marcovitch, Jacob, to Rotary Profile Anstalt. Apparatus for compacting a mass of granular material. 3,603,226, Cl. 94-50.

Maremont Corporation: *See—*
Pray, Lester W.; and Glazener, Carey A., 3,603,440.

Marini, Louis G.: *See—*
Marini, Thomas O.; and Marini, Louis G.,3,602,926.

Marini, Thomas O.; and Marini, Louis G. Folding bed or cot. 3,602,926, Cl. 5-111.

Marker, Hannes; and Oehlmann, Albert Gustav, said Oehlmann assor. to said Marker, Hannes. Toe iron for safety ski bindings. 3,603,607, Cl. 280-11.35

Maronde, Herbert; and Garitz, Karl Heinz, to Robot Foto und Electronic GmbH & Co., KG. Photographic monitoring device. 3,603,227, Cl. 95-1.1

Marquardt Industrial Products Co.: *See—*
Peel, Richard V., 3,603,786.

Martin, G. Drexhage: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,603,092.

Martin, Hugh. Electric heating panel. 3,603,764, Cl. 219-213.

Martinelli, Saverio: *See—*
DeVarda, Giorgio; Martinelli, Saverio; and Perna, Aldo,3,603,774.

Masco Corporation: *See—*
Holmes, Horace D., 3,603,132.

Mason, Elmer B. Magnetic motor with plurality of stators. 3,603,823, Cl. 310-46.

Massachusetts Institute of Technology: *See—*
Nicol, William S., 3,603,285.

Massaux, Henry Berthe Marie Joseph: *See—*
Huet, Jean-Jacques Henri Oscar; and Massaux, Henry Berthe Marie Joseph,3,602,977.

Masselot, Yves J. M.; and Poujol, Georges, to Commissariat l'Energie Atomique. Sintering furnace. 3,603,712, Cl. 13-20.

Mast, Fred, to Ciba Limited. Apparatus for transducing infrared images into visible images utilizing a liquid light control layer. 3,603,794, Cl. 250-83.3

Master Specialties Company: *See—*
Deed, John W., 3,603,741.

Mata, Samuel G. Brake shoe spreading hand tool. 3,602,973, Cl. 29-227.

Matsuda, Katsuji: *See—*
Hirota, Masao; Nakarai, Kazumi; Io, Kenji; Tanaka, Keiji; and Matsuda, Katsuji,3,603,643.

Matsumoto, Kazutoshi, to Nippon Koei Company, Limited. Line trap. 3,603,901, Cl. 333-76.

Matsumoto, Sakuzo: *See—*
Imai, Keikichi; and Matsumoto, Sakuzo,3,602,998.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kinugawa, Masao; Ikeda, Masachika; and Tanaka, Yutaka, 3,603,727.

Matsushita Electric Industrial Company, Limited: *See—*
Kino, Yoshihiro; and Nakayama, Yasuhiko, 3,603,766.

Matsushita Electronics Corporation: *See—*
Yamada, Heima; Sangen, Masashi; and Nomi, Kazumasa, 3,603,841.

Matsushita Graphic Communication Systems Inc.: *See—*
Kinugawa, Masao; Ikeda, Masachika; and Tanaka, Yutaka, 3,603,727.

Mattel, Inc.: *See—*
Davis, Homer S.; and Gay, Derek J., 3,603,024.
Staats, William A.; and Baynes, William R., 3,603,861.

Matthews, Peter C.: *See—*
Britt, Ronald H.; and Matthews, Peter C.,3,603,931.

Maurelli, Manlio: *See—*
Morane, Bruno; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert,3,603,483.

Max Corporation: *See—*
Nishikawa, Mitsuo, 3,603,497.

Max, Erhard: *See—*
Harris, Thomas J.; Kosanke, Kurt M.; Kulcke, Werner W.; and Max, Erhard,3,603,801.

Maxey, Carl W.; and Cage, Kenneth M., to Black Clawson Company, The. Sheet straightening mechanism. 3,603,446, Cl. 198-33.

Maxitrol Company: *See—*
Stang, Charles, Jr.; and Schlachter, Herbert J., 3,603,504.

Maxwell-Stewart, John P., to Jegco Inc. Plant-growth structure. 3,603,034, Cl. 47-38.

Maysteel Products Corporation: *See—*
Weber, Charles H., 3,603,651.

Maytag Company, The: *See—*
Bergeson, Richard P., 3,603,658.
Burkland, Charles W., 3,603,121.
Davis, Gordon Jerry, 3,603,749.
Kaldenberg, Henry J., 3,603,035.

McCarthy, Robert, to EEFP Corporation. Meat treating apparatus. 3,603,240, Cl. 99-251.

McCleery, Harold C. Mining ventilation apparatus and method. 3,603,644, Cl. 299-12.

McConnell, James C.: *See—*
Ansell, Willie T.; and McConnell, James C.,3,603,441.

McCoy, Darrel V.: *See—*
Lindberg, John E.; McCoy, Darrel V.; Schanck, Gordon J.; and Van Cleef, Harry E., Jr.,3,603,953.

McCrocklin, James W., to Callaway, A. S., mesne. Emission control assembly. 3,603,080, Cl. 60-30.

McCrocklin, James W., to Callaway, A. S., mesne. Emission control means. 3,603,081, Cl. 60-30.

McDonald, James E.: *See—*
Gouge, Edwin; and McDonald, James E.,3,603,540.

McDonald, William J., to Minnesota Mining and Manufacturing Company. Block grinding apparatus. 3,603,041, Cl. 51-138.

McDonald, William N.: *See—*
Jackman, Robert M.; and McDonald, William N.,3,603,182.

McDonald, William N.; and Hogan, William M., to Smith, A. O., Corporation. Fiber band regulator for fiberglass pipe winder. 3,603,517, Cl. 242-7.23

Mc Donnell, Arthur G.; and Munz, Roger L. Fire arms cleaning tool. 3,602,935, Cl. 15-104.09

McDonnell Douglas Corporation: *See—*
Esker, Donald W.; and Kroutil, Joseph, 3,603,089.
Walsh, Raymond T., 3,603,778.

McDonnell, Robert. Horseshoe and methods for shoeing a horse therewith. 3,603,402, Cl. 168-4.

McFadden, Robert N., to Graflex, Inc. Filmstrip take-up. 3,603,520, Cl. 242-55.21

McGee, Arthur L.: *See—*
Billett, Ronald J.; Chamberlin, Donald W.; and McGee, Arthur L.,3,603,463.

McGee, Roger J., to United States of America, Air Force, mesne. System for multi-channel variable time constant control. 3,603,859, Cl. 320-1.

Mc Gill, Howard L., to Schlumberger Technology Corporation. Fluid pressure responsive well packer. 3,603,390, Cl. 166-196.

Mc Gill, Howard L., to Schlumberger Technology Corporation. Well packer anchor. 3,603,392, Cl. 166-216.

McGraw-Edison Company: *See—*
Abromaitis, Andre T., 3,603,282.

McGregor, Eugene R.; and Koji, Alex I., to Universal Oil Products Company. Vehicle seat support structure. 3,603,638, Cl. 297-216.

McHugh, Timothy J. Toy ball. 3,603,023, Cl. 46-1.

McKenna Equipment Company, Inc.: *See—*
Knudsen, David S., 3,603,250.

McKinnell, John C.: *See—*
Hutchinson, Stanley O.; and McKinnell, John C.,3,603,398.

McKown, Rss D., to United States of America, Army, mesne. Ultrasonic liquid level indicator. 3,603,149, Cl. 73-290.

McLean, James N.: *See—*
Atwood, Hyatt B.; and McLean, James N.,3,603,070.

McLean, Ronald H., to Litton Business Systems Inc. Selective ribbon handling mechanism for carbon and fabric ribbons. 3,603,443, Cl. 197-156.

Mc Mann, Renville H., Jr., to Columbia Broadcasting System, Inc. Color television conversion apparatus. 3,603,724, Cl. 178-5.4

Mead, Carver A.: *See—*
Kurtin, Stephen L.; and Mead, Carver A.,3,603,150.

Mead Corporation, The: *See—*
Howard, Sam B.; and Black, Kendrick E., 3,603,502.
Wood, Prentice J., 3,603,477.

Medicus, Gustav K. Gas lasers with improved capillary tube. 3,603,895, Cl. 331-94.5

Medlinski, William W., to Bendix Corporation, The. Fault identification, isolation and display for use with an aircraft control system. 3,603,948, Cl. 340-214.

Melnik, Alexandr Vasilievich: *See—*
Juzvenko, Jury Arsenievich; Lanina, Tamara Vladimirovna; Shimanovsky, Vasily Pavlovich; Gavrish, Vasily Antonovich; Paschenko, Mark Antonovich; Melnik, Alexandr Vasilievich; Zhurkovsky, Igor Sergeevich; and Vaksin, Moisei Isaakovich,3,603,763.

MeLowe, Allan: *See—*
Hubbs, Charles H., 3,603,506.

Mercer, Elmer W. Fishing rod accessory. 3,603,018, Cl. 43-19.2

Merchant, Floyd S. Intrusion alarm system and line voltage compensation. 3,603,957, Cl. 340-258.
Merel, Wolfgang, to United States of America, Navy, mesne. Electroluminescent panel driver. 3,603,812, Cl. 307-239.
Merrien, Louis: *See—*
Morane, Bruno; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert,3,603,483.
Merrill, Samuel E.; and Krosoczka, Joseph D., to Sem-Tec, Inc. Cavity wall valve balls. 3,603,560, Cl. 251-309.
Messrs. Gebruder Junghans G.m.b.H.: *See—*
Ganter, Wolfgang; and Otto, Heinz, 3,603,074.
Ganter, Wolfgang, 3,603,077.
Metalloxyd GmbH: *See—*
Herrmann, Helmut, 3,603,522.
Metcalfe, Kenneth A.; and Smith, Ian E., to Commonwealth of Australia, The. Method of contour charging. 3,603,851, Cl. 317-262.
Metronics Incorporated: *See—*
Harmes, Oren B., 3,603,061.
Metropolitan Stevedore Company: *See—*
Ide, Allan R., 3,603,635.
Mettoy Company Limited, The: *See—*
Fairbairn, Howard W., 3,603,031.
Meyer, Jackie R.: *See—*
Follen, Robert J.; Harman, Charles P., Jr.; and Meyer, Jackie R.,3,603,993.
Meyer, John A.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,603,683.
Meyer, William A., III. Paint can hanger. 3,603,548, Cl. 248-211.
Mezey, Clifford W.: *See—*
Thompson, Tom H., 3,603,610.
Michael, Horst; and Schabert, Hans-Peter, to Siemens Aktiengesellschaft. Steam generator, particularly for pressurized water nuclear reactors. 3,603,383, Cl. 165-158.
Michalek, Slavomir: *See—*
Cermak, Antonin; Michalek, Slavomir; and Strait, Zdenek,3,603,706.
Middleton, Verne L., to Olin Corporation. Inflation apparatus for metal strip or panels having inflatable fluid passageways. 3,603,128, Cl. 72-58.
Mighton, Perceptimus J., to Harter, Mary C. Machine tool. 3,603,045, Cl. 51-170.
Miles, John R.: *See—*
Garber, Donovan L.; Seidelle, James N.; and Miles, John R.,3,603,726.
Miller, Charles G.: *See—*
Anderson, Lloyd E., Sr.; Harper, George C.; Leber, William; and Miller, Charles G.,3,603,204.
Miller, George H.: *See—*
Manetti, Fred P.; and Miller, George H.,3,603,914.
Miller, Lacy J., Machine Company, Inc.: *See—*
Byrd, Clarence D., 3,603,550.
Miller, Linton L.: *See—*
Neff, Edsel B., Sr.; and Miller, Linton L.,3,602,942.
Miller Printing Machinery Co.: *See—*
Siebke, Carl O., 3,603,254.
Miller, Robert L. Wheel liners for track type vehicle. 3,603,650, Cl. 305-25.
Miller, Stephen N.: *See—*
Bernstein, Allen; and Miller, Stephen N.,3,603,991.
Miller, Walter L. Sawing jig for opening public telephone boxes. 3,602,987, Cl. 30-273.
Mills Scaffold Company Limited: *See—*
Wheelock, Colin, 3,603,552.
Milton, Richard S., to United States of America, Army. Controlled field alternator charging system. 3,603,868, Cl. 322-7.
Miner Industries, Inc.: *See—*
Lewis, Peter, 3,603,663.
Minnesota Mining and Manufacturing Company: *See—*
Erickson, Roy D., 3,603,911.
McDonald, William J., 3,603,041.
Nelson, Norman E., 3,603,235.
Minolta Camera Kabushiki Kaisha: *See—*
Kobayashi, Tatsuo; Fujii, Yoshifusa; and Ueda, Hiroshi, 3,603,781.
Umeda, Kaoru, 3,603,523.
Miracle Instrument Co.: *See—*
Ostrager, Seymour A., 3,603,000.
Miraldi, Floro D.; and Morgan, Edward J. Gamma radiation source and method for the treatment of sewage. 3,603,788, Cl. 250-44.
Mitchell, Andrew: *See—*
Barton, Robert Hall; Brown, Martin Luther; and Mitchell, Andrew,3,603,221.
Mitchell, Boris J., to General Motors Corporation. Engine camshaft and accessory drive. 3,603,296, Cl. 123-44.46
Mitchell, William, to Northern Electric Company Limited. Mechanical-electrical code generating device employing fluid switching. 3,603,983, Cl. 340-365.
Mitsui Toatsu Chemicals, Incorporated: *See—*
Hirota, Masao; Nakarai, Kazumi; Io, Kenji; Tanaka, Keiji; and Matsuda, Katsuji, 3,603,643.
Mix-O-Matic Corporation: *See—*
Ogle, Robert W., 3,603,484.
Miyata, Susumu: *See—*
Maeda, Teruo; and Miyata, Susumu,3,603,421.
Mobil Oil Corporation: *See—*
Angona, Frank A., 3,603,410.
Talley, William A. Jr., 3,603,386.
Modine Manufacturing Company: *See—*
Huggins, Homer D.; and Dudley, Jack C., 3,603,384.
Moen, Robert L.: *See—*
Robbins, Charles H.; Fitzsimmons, George W.; Hughes, Robert L.; and Moen, Robert L.,3,603,062.
Moffett, Oren D., to Frank W. Manufacturer, Inc. Safety shut-down device for stationary diesel engines. 3,603,300, Cl. 123-198.
Mohawk Data Sciences Corporation: *See—*
Orsatti, Louis G., 3,603,252.
Ward, Leonard G.; and Mac Neill, John H., 3,603,442.
Molins Machine Company, Limited, The: *See—*
Christal, Philip Richard, 3,603,581.
Molle, Nicolaas Johannes Maria, to U.S. Philips Corporation. JK-flip-flop. 3,603,819, Cl. 307-291.
Molnlycke Akiebolaget: *See—*
Aberg, Sven Ulrik, 3,603,314.
Mondia S.A.: *See—*
Theurillat, Xavier, 3,603,076.
Mondo Kabushiki Kaisha: *See—*
Wada, Eiichi, 3,603,595.
Monroe, Edwin P. Reinforced elastic material and methods of manufacture. 3,603,350, Cl. 138-126.
Monsanto Company: *See—*
Armour, Donald F., 3,603,470.
Holland, William Edward, 3,603,563.
LaPierre, Arthur W.; and Kull, Edward A., 3,603,511.
Scopp, Howard A.; and Sincock, Thomas F., 3,603,286.
Montech Incorporated: *See—*
Bracken, Pat O.; and Lane, George H., 3,603,951.
Moore, Ralph C., to Xerox Corporation, mesne. Memory port priority access system with inhibition of low priority lack-out. 3,603,935, Cl. 340-172.5
Moore, Richard K., to Kansas University Endowment Association, The. Poly-panchromatic target identification. 3,603,919, Cl. 340-1.
Moos, Franz; and Loffler, Gerhard, to Schnellpressenfabrik Frankenthal Albert & Cie, Aktiengesellschaft. Device for fixing form saddles on the rotary press form cylinder. 3,603,256, Cl. 101-378.
Moragne, Edward L. Muzzle brake. 3,603,202, Cl. 89-14.
Morane, Bruno; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert, to L'Oreal. Device for storing two products separately and dispensing them simultaneously. 3,603,483, Cl. 222-82.
Morelli, Enrico: *See—*
Turini, Francesco, 3,603,116.
Morgan, Edward J.: *See—*
Miraldi, Floro D.; and Morgan, Edward J.,3,603,788.
Morgan Industries, Inc.: *See—*
Morgan, Philip R., 3,602,947.
Morgan, Philip R., to Morgan Industries, Inc. Automatic control system. 3,602,947, Cl. 18-30.
Mori, Miyoshi: *See—*
Mori, Miyoshi; and Hyoudou, Miyako, 3,603,693.
Mori, Miyoshi; and Hyoudou, Miyako, to Mori, Miyoshi, and Suganuma, Masiayoshi, mesne. Automatic pencil. 3,603,693, Cl. 401-81.
Morris, Billy P., to Western Company of North America, Inc., The. Monitoring fluids in a borehole. 3,603,145, Cl. 73-155.
Morris, Charles William; and Ulyate, John Raymond, to Chromalloy American Corporation. Method and apparatus for mass emission sampling of motor vehicle exhaust gases. 3,603,155, Cl. 73-421.
Morris, Philip, Incorporated: *See—*
Badgett, Charles E.; and Osmalov, Jerome S., 3,603,319.
Morris, Tom C.: *See—*
Brouwer, Jerome J.; Church, Gerald C.; and Morris, Tom C.,3,603,997.
Morris, William; and Rosendall, Henry J., to Bissell Inc. Floor sweeper with improved drive coupling. 3,602,932, Cl. 15-41.
Morroll, Terence David, to Ericsson Telephones Limited. Telecommunication exchanges. 3,603,736, Cl. 179-15.
Morrow, Jack A., to United Control Corporation. Preload adjustment means for a transducer. 3,603,159, Cl. 73-517.
Moser, Theo, to Hofliger & Karg. Transfer arrangement. 3,603,462, Cl. 214-8.5
Mosier Industries, Inc.: *See—*
Wright, Lee A., 3,603,348.
Motorola, Inc.: *See—*
Cecchin, Gildo; and Hilbert, Francis H., 3,603,894.
Havens, Richard Calvin, 3,603,896.
Zaura, Paul J., Jr; Hawkins, George C.; and Cannalte, Gary A., 3,603,884.
Mottin, Ralph E.; and Garland, Carl C., to Parke, Davis & Company. Disposable syringe. 3,603,310, Cl. 128-218.
Mottin, Ralph E.: *See—*
Lucas, Paul A.; and Mottin, Ralph E.,3,603,312.
Moy, Ernest F., Limited: *See—*
Boniface, Roy, 3,603,545.
Mueller, Leonard E. Flying rotorcraft toy. 3,603,033, Cl. 46-740.
Muller, Anton, to Eisen-und Drahtwerk Erlau AG. Anti-skid and tire-protective chains. 3,603,371, Cl. 152-239.

Muller, Roger; and Fenner, Theodor, to Etablissements D.F. Arrangement of two or more automatically operating punching machines in form of a cooperating machine set. 3,603,191, Cl. 83-405.

Mumma, Harold J.; and Parry, Curtis L., to FMC Corporation. Fruit marking machine. 3,603,249, Cl. 101-35.

Munz, Roger L.: *See—*
Mc Donnell, Arthur G.; and Munz, Roger L.,3,602,935.

Murchison, Jerre M.; and Antonio, Alexander G., to General Dynamics Corporation. Means and method for detecting doppler signals submerged in clutter. 3,603,996, Cl. 343-7.7

Murcott, Charles E.; and Salerno, Arthur, to Lumex, Inc. Adjustable bed rail unit. 3,602,929, Cl. 5-331.

Murphy, G. W., Industries, Inc.: *See—*
Botefuhr, Harold R., 3,603,360.

Murphy, James R., Sr. Toaster-attached bun warmer. 3,603,242, Cl. 99-339.

Murphy, John B.: *See—*
Brecker, Nicholas L., Jr.; and Murphy, John B.,3,603,880.

Murrell, Donald K., to Robertshaw Controls Company. Pressure regulator converter. 3,603,214, Cl. 92-133.

Musial, Joseph A.: *See—*
Vigor, Charles W.; and Musial, Joseph A.,3,603,186.

Myers, Michael R., to Phillips Petroleum Company. Wrapping apparatus. 3,603,220, Cl. 93-77.

Myrtle Desk Company: *See—*
Ruffert, Klaus P., 3,603,546.

Naber, Edwin; and Naber, Paul. Rock lifter. 3,603,007, Cl. 37-2.

Naber, Paul: *See—*
Naber, Edwin; and Naber, Paul,3,603,007.

Nagai, Isao: *See—*
Hashizume, Toichi; Nagai, Isao; Umeda, Katsuhiko; Otokuni, Tadaaki; and Takahashi, Yuji,3,603,438.

Nakada, Akira, to Nippon Gakki Seizo Kabushiki Kaisha. Tone color changing device for electronic musical instruments. 3,603,713, Cl. 84-1.19

Nakamura, Norihiko: *See—*
Toda, Tadahide; Nakamura, Norihiko; and Oishi, Kiyohiko,3,603,298.

Nakanishi, Shigeo, to United States of America, National Aeronautics and Space Administration. Ion thruster cathode. 3,603,088, Cl. 60-202.

Nakarai, Kazumi: *See—*
Hirota, Masao; Nakarai, Kazumi; Io, Kenji; Tanaka, Keiji; and Matsuda, Katsuji,3,603,643.

Nakata, Yoshihiro; and Kukuminato, Testuo. Tube joint coupling. 3,603,620, Cl. 285-189.

Nakayama, Yasuhiko: *See—*
Kino, Yoshihiro; and Nakayama, Yasuhiko,3,603,766.

Nameche, Alfred E.; and Norton, Walter F. Ladder and support bracket therefor. 3,603,431, Cl. 182-206.

Narmo, Sverre: *See—*
Odegaard, Magne; and Narmo, Sverre,3,602,962.

Narukiyo, Yasumasa, to Okuma Machinery Works Ltd. None-ambiguous reading systems for analog-to- digital converters. 3,603,978, Cl. 340-347.

National Cash Register Company, The: *See—*
Kasper, Bernhard O. A.; and Rombach, Friedrich, 3,603,503.
Patti, David M., 3,603,982.

National Research Development Corporation: *See—*
Firth, Donald; and Cunningham, Sinclair Upton, 3,603,211.

Naylor, Vernon G. H., to Sommonds Precision Products, Inc. Electronic sweep programmer circuit for supplying coil current in testing a piston assembly. 3,603,906, Cl. 331-111.

Nechine, Leonard M., to FMC Corporation. Gas dispersing apparatus. 3,603,509, Cl. 239-145.

Neese, Doris F. Facial protection for hair spray. 3,602,913, Cl. 2-9.

Neff, Edsel B., Sr.; and Miller, Linton L. Door hinge stop. 3,602,942, Cl. 16-191.

Neild, Peter J., to Bloedel, Mac Millan Limited. Log carriage apparatus. 3,603,362, Cl. 143-105.

Neilson, William, to Imperial Chemical Industries Limited. Apparatus for marine seismographic prospecting. 3,603,426, Cl. 181-0.5

Nejezchleb, Vladimir: *See—*
Badum, Paul J.; and Nejezchleb, Vladimir,3,603,943.

Nelligan, William B., to Schlumberger Technology Corporation. Signaling system. 3,603,923, Cl. 340-18.

Nelson, Bobby H.; and Baugh, Benton F., to Vetco Offshore Industries, Inc. Tubing hanging method and apparatus. 3,603,401, Cl. 166-313.

Nelson, Irving O.: *See—*
Halldorson, Halldor K.; and Nelson, Irving O.,3,603,330.

Nelson, Norman E., to Minnesota Mining and Manufacturing Company. Shutter-operating and film-advancing mechanism. 3,603,235, Cl. 95-31.

Nelson, Ralph M., to Bendix Corporation, The. Flexible hold-down band for brake shoe and lining holding fixture. 3,603,582, Cl. 269-321.

Nelson, Richard Dale: *See—*
Arnold, Loren Glenn; and Nelson, Richard Dale,3,603,405.

Neptune Meter Company: *See—*
Smith, Edward C., 3,603,144.

Neuffer, Ingemar; Eichmann, Dieter; and Langweiler, Frank, to Siemens Aktiengesellschaft. Device for producing direct voltage proportional to speed. 3,603,869, Cl. 322-31.

Neuville, Bernard; Ledoux, Claude; and Hess, Raoul, to Produits Chimiques Pechiney-Saint-Gobain. Plastic extrusion machine. 3,602,943, Cl. 18-12.

New Cosmos Electric Company, Limited: *See—*
Takeuchi, Tutaharu, 3,603,954.

Newman, Charles W.; and Clement, H. James. Method and apparatus for riveting with titanium alloys. 3,603,126, Cl. 72-28.

Newton, Chambers & Compay Limited: *See—*
Richmond, Stuart; and Exley, David W., 3,603,103.

Nicol, William S., to Massachusetts Institute of Technology. Vapor deposition apparatus. 3,603,285, Cl. 118-48.

Niezoldi and Kramer GmbH: *See—*
Anderl, Peter; Roth, Johann; and Steibl, Theodor, 3,603,678.

Nikolaev, Vyacheslav Mikhailovich: *See—*
Khrenov, Konstantin Konstantinovich; Chudakov, Vyacheslav Andreevich; Strogenov, Konstantin Vasilievich; Kleiman, Vladimir Leonidovich; Fishkis, Mikhail Mironovich; Nikolaev, Vyacheslav Mikhailovich; Kalnishevsky, Vladimir Konmunarovich; and Maltsev, Boris Mikhailovich,3,603,760.

Nippon Electric Company, Limited: *See—*
Hatori, Kozo; Watanabe, Hitoshi; and Yoshida, Nobuyoshi, 3,603,900.

Nippon Electric Company, Ltd.: *See—*
Uchida, Teiji; and Sakaguchi, Mitsuhito, 3,603,666.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Adachi, Takeshi, 3,603,714.
Nakada, Akira, 3,603,713.
Sotome, Hiromi, 3,603,427.
Uchiyama, Yasuji, 3,603,809.
Yamauchi, Takao, 3,603,170.

Nippon Koei Company, Limited: *See—*
Matsumoto, Kazutoshi, 3,603,901.

Nippon Kokan Kabushiki Kaisha: *See—*
Arimura, Tohru; Kamata, Masamoto; Saito, Morio; and Okamoto, Terumi, 3,603,124.

Nippon Selfoc Company, Limited: *See—*
Uchida, Teiji; and Sakaguchi, Mitsuhito, 3,603,666.

Nishikawa, Mitsuo, to Max Corporation. Binder for grape vines. 3,603,497, Cl. 227-76.

Nishizawa, Mitsunori: *See—*
Irie, Yoshihiko; Nishizawa, Mitsunori; and Yamawaki, Shunro,3,603,480.

Niskovskikh, Vitaly Maximovich: *See—*
Khimich, Georgy Lukich; Niskovskikh, Vitaly Maximovich; Varaxin, Alexei Ivanovich; Gelfenbein, Evgeny Jukhimovich; and Bykov, Vladimir Alexandrovich,3,603,377.

Nissan Jidosha Kabushiki Kaisha: *See—*
Maeda, Teruo; and Miyata, Susumu, 3,603,421.

Nissan Motor Company, Limited: *See—*
Hashizume, Toichi; Nagai, Isao; Umeda, Katsuhiko; Otokuni, Tadaaki; and Takahashi, Yuji, 3,603,438.

Noack, Rolf; and Weise, Johannes, to VEB Pentacon Dresden Kamera- und Kinowerke. Flash light ignition device for photographic cameras. 3,603,229, Cl. 95-11.5

Nobusawa, Tsukumo, to Asahi Kogaku Kogy Kabushiki Kaisha. Light measuring device comprising a plurality of binary circuits for providing a digital representation of photocell output. 3,603,799, Cl. 250-214.

Nomi, Kazumasa: *See—*
Yamada, Heima; Sangen, Masashi; and Nomi, Kazumasa,3,603,841.

Nordisk Ventilator Co., A/S: *See—*
Bensen, Carl Erling, 3,603,698.

Norem, Stanley D., to Perkin-Elmer Corporation, The. Detector arrangements for analytical apparatus. 3,603,134, Cl. 73-27.

Norinder, Ivar H.: *See—*
Schwiebert, Phillip D.; and Norinder, Ivar H.,3,603,078.

Norrs, Gene M. Noise rejecting signal filter. 3,603,886, Cl. 325-476.

North, Roger W. Drum. 3,603,194, Cl. 84-411.

Northern Electric Company Limited: *See—*
Cambridge, Ronan Malcolm, 3,603,740.
Mitchell, William, 3,603,983.

Northrop Corporation: *See—*
Seefeld, Le Roy P., 3,603,198.

Norton, Walter F.: *See—*
Nameche, Alfred E.; and Norton, Walter F.,3,603,431.

Nosch, Edwin, to Telefunken Patentverwertungsgesellschaft m.b.H. Method of producing semi-conductor devices. 3,602,985, Cl. 29-588.

Notes, Robert J., 1/2 to Roeder, Lyle W. Apparatus for storing phonograph records. 3,603,460, Cl. 211-40.

Nouel, Robert Ange Marie, to Inventions Finance Corporation. Device for driving the platen of a press. 3,603,248, Cl. 100-218.

Novak, Emil J., to Hamilton-Hastings Company Ltd. Spark plug with single-piece ceramic insulator with tubular portion extending into scavenging chamber. 3,603,834, Cl. 313-11.5

Novoa, Jose M. Building construction system. 3,603,052, Cl. 52-257.

Nunley, John F. Fish hook disengaging tool. 3,603,021, Cl. 43-53.5

Nurmse, Karl; and Svensson, Hugo Ragnvald, to ABU Aktiebolag. Fishing reels, especially fly-fishing reels. 3,603,524, Cl. 242-84.1

Nus Corporation: *See—*
Cirulis, Uldis, 3,603,873.

Nutting, William B., to Horsman Dolls Inc. Kiss-throwing doll. 3,603,029, Cl. 46-117.

N.V. Industrieele Handelscombinate: *See—*
Velzeboer, Pieter Theodor, 3,603,009.
Oaks, William D., to United States of America, Navy. Method of forming bimetallic transition joints. 3,602,978, Cl. 29-471.1
O'Brien, Martin F.:*See—*
Cochran, John M., Jr.; and O'Brien, Martin F.,3,603,518.
Odegaard, Magne; and Narmo, Sverre, to Ringsted Jernstobers & Maskinfabrik A/S Ringsted. Machines for simultaneous molding of a number of concrete pipes. 3,602,962, Cl. 25-30.
Odom, John E. Fluid actuated vises. 3,603,579, Cl. 269-28.
Odone, Giovanni: *See—*
De Andres, Jesus; and Odone, Giovanni,3,603,800.
Oehlmann, Albert Gustav: *See—*
Marker, Hannes; and Oehlmann, Albert Gustav,3,603,607.
Offshore Systems Inc.: *See—*
Jones, Durward B., 3,603,385.
Ogle, Robert W., to Mix-O-Matic Corporation. Two compartment mixing end dispensing device. 3,603,484, Cl. 222-94.
Ohashi, Shin-Ichi, to Hitachi, Ltd. Series-shunt type semiconductor chopper. 3,603,814, Cl. 307-240.
Ohms, Edward J.: *See—*
Blood, Ernest R.; and Ohms, Edward J.,3,603,424.
Oishi, Kiyohiko: *See—*
Toda, Tadahide; Nakamura, Norihiko; and Oishi, Kiyohiko,3,603,298.
Okamoto, Terumi: *See—*
Arimura, Tohru; Kamata, Masamoto; Saito, Morio; and Okamoto, Terumi,3,603,124.
Okamoto, Yoshihiko: *See—*
Sato, Tai; Takeishi, Yoshiyuki; Okamoto, Yoshihiko; and Hara, Hisashi,3,603,848.
Okano, Tohei; and Kannari, Takehiko, to Tsubakimoto Chain Manufacturing Co., Ltd. Conveyer apparatus. 3,603,448, Cl. 198-162.
Okazaki, Takashi, to Shinmeiwa Rogyo Kabushiki Kaisha. Apparatus for driving a device mounted on special-purpose vehicles. 3,603,084, Cl. 60-52.
Okuma Machinery Works Ltd.: *See—*
Narukiyo, Yasumasa, 3,603,978.
Olin Corporation: *See—*
Middleton, Verne L., 3,603,128.
Olympus Optical Company, Ltd.: *See—*
Imai, Keikichi; and Matsumoto, Sakuzo, 3,602,998.
O'Neil, Kevin B.; Fraser, Cameron R.; and Helms, Paul E., Jr., to Goodyear Tire & Rubber Company, The. Cords for annular reinforcing tire belts. 3,603,071, Cl. 57-140.
Opal, Kenneth E., to Borg-Warner Corporation, mesne. Energizing system with digital control circuit for regulating multiphase inverter. 3,603,866, Cl. 321-45.
Oppenheimer, Jess. Optical exposure system. 3,603,231, Cl. 95-15.
Oppenheimer, Jess. Sensory development apparatus. 3,603,305, Cl. 128-76.5
Ormsby, Thomas R., to Eastman Kodak Company. Web winding apparatus. 3,603,521, Cl. 242-56.2
O'Rork, David B. Pet-operated animal toilet. 3,603,290, Cl. 119-1.
Orsatti, Louis G., to Mohawk Data Sciences Corporation. Zero suppression circuits in high speed numeric printing. 3,603,252, Cl. 101-93.
Osborne , Arthur P., to Girling Limited. Fluid level indicators. 3,603,927, Cl. 340-59.
Osmalov, Jerome S.: *See—*
Badgett, Charles E.; and Osmalov, Jerome S.,3,603,319.
Ostrager, Seymour A., to Miracle Instrument Co. Spirit level frame for mounting spirit vial units. 3,603,000, Cl. 33-211.
Otis Engineering Corporation: *See—*
Fredd, John V., 3,603,110.
Raulins, George Max, 3,603,394.
Otokuni, Tadaaki: *See—*
Hashizume, Toichi; Nagai, Isao; Umeda, Katsuhiko; Otokuni, Tadaaki; and Takahashi, Yuji,3,603,438.
Otto, Heinz: *See—*
Ganter, Wolfgang; and Otto, Heinz,3,603,074.
Owen, Radford K., to General Electric Company. Mounting device for a wound inductor. 3,603,917, Cl. 339-220.
Owens-Illinois, Inc.: *See—*
Ludder, Rodney E., 3,603,218.
Padula, Lawrence D., to Skinner Precision Industries, Inc. Reinforced seal. 3,603,602, Cl. 277-164.
Pailand S.A.: *See—*
Lai, Kow-Fat; and Lietar, Christian, 3,603,669.
Paillard S.A.: *See—*
De Andres, Jesus; and Odone, Giovanni, 3,603,800.
Paine, T. O., Administrator of the National Aeronautics and Space Administration with respect to an invention of,; Wyman, Charles L.; Gould, John M.; Johnson, Robert E.; and Weiss, Paul F. Acquisition and tracking system for optical radar. 3,603,686, Cl. 356-152.
Paine, Thomas O., Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Buzzard, Robert J.; and Basiulis, Algerd. Radial heat flux transformer. 3,603,382, Cl. 165-105.
Paliyenko, Paul; and Rollinson, Stanley, to Fiber Industries, Inc. Cohered yarn fabrics and method for forming said yarn. 3,603,043, Cl. 57-140.
Palleiko, Benjamin, to Sanders Associates, Inc. Pulsed doppler detection system. 3,603,999, Cl. 343-17.1
Paoletti, Charles: *See—*
Morane, Bruno; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert,3,603,483.
Paolini, Joseph J. Full flow with shut off and selective drainage control valve. 3,603,347, Cl. 137-625.17
Parke, Davis & Company: *See—*
Lucas, Paul A.; and Mottin, Ralph E., 3,603,312.
Mottin, Ralph E.; and Garland, Carl C., 3,603,310.
Serrell, John J.; and Sparks, George C., 3,603,453.
Parker, Lawrence E.: *See—*
Christy, Daniel LaMar; and Parker, Lawrence E.,3,603,287.
Parmegiani, Mario; and Clementi, Anacleto, to Snam Progetti, S.p.A. Process for the production of ethylene oxide. 3,603,085, Cl. 60-39.02
Parrett, John T., to Koehring Company, Incorporated. Multiple cylinder telescopic actuator. 3,603,207, Cl. 91-167.
Parry, Curtis L.: *See—*
Mumma, Harold J.; and Parry, Curtis L.,3,603,249.
Parsons, Frederick L. Hose coupling. 3,603,621, Cl. 285-319.
Parsons, Howard Gaubb, Sir and Company Limited: *See—*
Brown, David Scatcherd, 3,603,671.
Paschenko, Mark Antonovich: *See—*
Juzvenko, Jury Arsenievich; Lanina, Tamara Vladimirovna; Shimanovsky, Vasily Pavlovich; Gavrish, Vasily Antonovich; Paschenko, Mark Antonovich; Melnik, Alexandr Vasilievich; Zhurkovsky, Igor Sergeevich; and Vaksin, Moisei Isaakovich,3,603,763.
Patchen, Paul J.; and Kula, Frank C., to Allis-Chalmers Manufacturing Company. Cap screw with piloting surface. 3,603,174, Cl. 74-594.
Paterson, Werner A. Dental model trimmer with a combined mounting support and sediment tray. 3,603,040, Cl. 51-125.
Patti, David M., to National Cash Register Company, The. Data entry means. 3,603,982, Cl. 340-365.
Paul, Gerard T.: *See—*
Woschetzky, Werner; and Paul, Gerard T.,3,603,971.
Payea, Jean Francis. Radius and angle dresser device. 3,603,302, Cl. 125-11.
Payne, Jesse W.; and Rudd, Charles E. Portable wire holder rack. 3,603,526, Cl. 242-129.8
Peacock, George Raymond, to Industrial Magnetics, Inc. Welding and forming method. 3,603,759, Cl. 219-9.5
Pearson, David Sadler, to Rolls-Royce Limited. Rotary internal combustion engines. 3,603,326, Cl. 123-8.41
Peel, Richard V., to Marquardt Industrial Products Co. Railroad grade crossing protection system. 3,603,786, Cl. 246-128.
Pelta, Edmond R., to Autoscan, Inc. Apparatus using current signals to analyze the ignition of an engine. 3,603,872, Cl. 324-16.
Pelta, Edmond R.; and Gold, Kenneth Stewart, to Autoscan, Inc. Apparatus for measuring the frequency of occurence of ignition signals in a multicylinder engine. 3,603,879, Cl. 324-161.
Peray, Jean-Marie, to Grace, W. R., & Co. Intrinsic mobility control in petroleum recovery. 3,603,397, Cl. 166-270.
Perez, George R., to AMF Incorporated. Automatically releasable connectors. 3,602,959, Cl. 24-230.
Perfect Film & Chemical Corporation: *See—*
Jones, Richard B., 3,603,232.
Perkin-Elmer Corporation, The: *See—*
Norem, Stanley D., 3,603,134.
Smith-Vaniz, William Reid, 3,603,688.
Woschetzky, Werner; and Paul, Gerard T., 3,603,971.
Perkin-Elmer Limited: *See—*
Caunter, Jeffrey Malcolm; and Higham, Peter, 3,603,871.
Perna, Aldo: *See—*
DeVarda, Giorgio; Martinelli, Saverio; and Perna, Aldo,3,603,774.
Peters, Norman J., to DEC International Inc. Method and apparatus for making cheese. 3,602,992, Cl. 31-46.
Peterson, Darwin H. Tool holding device. 3,603,551, Cl. 248-314.
Peterson, Erwin P.Pneumatic tester for lineman's gloves. 3,603,138, Cl. 73-37.
Petric, Frank. Remote control automobile motor starter. 3,603,802, Cl. 290-37.
Petrie, Charles N.: *See—*
Lederman, Warren A.; and Petrie, Charles N.,3,603,335.
Petrosky, Willard L.: *See—*
Pope, Gerald R.; Weeden, Frank G.; and Petrosky, Willard L.,3,602,945.
Petsinger, Robert E., to LNG Services, Inc. Method and system for magnetohydrodynamic generation of electricity. 3,603,822, Cl. 310-11.
Pfizer Inc.: *See—*
Raaf, Helmut W., 3,603,454.
Phelps Dodge Copper Products Corporation: *See—*
Yearley, Douglas C., 3,603,378.
Philco-Ford Corporation: *See—*
Focht, Louis R., 3,603,738.
Phillips Petroleum Company: *See—*
Hendrix, Hurshel V., 3,603,095.
Myers, Michael R., 3,603,220.
Phillips, William V.: *See—*
Tipping, Roderick G.; and Phillips, William V.,3,603,176.
Phoenix, Lancelot: *See—*
Hill, William Frank; and Phoenix, Lancelot,3,603,612.

Piazzolla, Giovanni; and Villa, Carlo. Dobby for looms. 3,603,351, Cl. 139-79.

Piccione, Fred A., to Angelo, Alfred, Inc. Headpiece and snap-on veil. 3,602,919, Cl. 2-207.

Picker, Edwin H.: *See—*
Charlap, Morris I.; and Picker, Edwin H.,3,603,673.

Pierce, William C., 1/3 to Garcia, Joseph A., and Garcia, Roy C. Wall panel construction and assembly including improved edge and bottom sealing. 3,603,049, Cl. 52-241.

Pietsch, Ervin I.; and Carney, John L., Jr., to ACF Industries, Incorporated. Loading apparatus for railway hopper cars. 3,603,439, Cl. 193-25.

Pihlblad, Robert W.: *See—*
Jayne, Max L.; and Pihlblad, Robert W.,3,603,915.

Pilkington Perkin-Elmer Limited: *See—*
Freeman, Michael H., 3,603,667.

Pine Tree Engineering: *See—*
Fandetti, Matthew R., 3,603,169.

Pinkham, Jesse R., to Reynolds, R. J., Tobacco Company. Method and apparatus for harvesting tobacco. 3,603,064, Cl. 56-27.5

Pioch, Robert J., to Kysor Industrial Corporation. Compaction loading apparatus. 3,603,245, Cl. 100-50.

Pipe Line Development Company, The: *See—*
Smith, Joseph B., 3,603,616.

Pittsburgh-Des Moines Steel Company: *See—*
Anderson, Lloyd E., Sr.; Harper, George C.; Leber, William; and Miller, Charles G., 3,603,204.

Plessey Company Limited, The: *See—*
Britt, Ronald H., 3,603,930.
Britt, Ronald H.; and Matthews, Peter C., 3,603,931.
Davies, Guy E.; and Wilson, Christopher G. S., 3,603,334.
Kahn, Peter Bruno, 3,603,406.

Pneumo Dynamics Corporation: *See—*
Geyer, Howard M., 3,603,212.
Tootle, James N., 3,603,213.

Podraza, George V., to U.S. Philips Corporation, mesne. High speed digital circuits. 3,603,815, Cl. 307-247.

Podraza, George V., to Bunker-Ramo Corporation, The. High speed digital circuits. 3,603,816, Cl. 307-247.

Poirier, Joseph L. Spectrum analysis radar system. 3,603,990, Cl. 343-5.

Polinek, Charles J. Backhoe excavator with endless bucket attachment. 3,603,010, Cl. 37-83.

Pope, Gerald R.; Weeden, Frank G.; and Petrosky, Willard L., to Dore, John L., Co. Apparatus for making a plastic expansion joint. 3,602,945, Cl. 18-19.

Poppelbaum, Wolfgang J.: *See—*
Rollenhagen, David C.; and Poppelbaum, Wolfgang J.,3,603,981.

Porrot, Emile: *See—*
Chenault, Roger; Portal, Guy; Porrot, Emile; and Prigent, Raymond,3,603,791.

Portal, Guy: *See—*
Chenault, Roger; Portal, Guy; Porrot, Emile; and Prigent, Raymond,3,603,791.

Posey, William L., to United States Steel Corporation. Eddy current inspection device for elongated material with means to eliminate the end effect. 3,603,874, Cl. 324-40.

Pott, Richard, to Westland-Gummiwerke GmbH & Co. Belt conveyor. 3,603,447, Cl. 198-152.

Poujol, Georges: *See—*
Masselot, Yves J. M.; and Poujol, Georges,3,603,712.

Powers, Patrick, to Associated Electrical Industries Limited. Spark-type for source and downstream deflector for mass spectrometer. 3,603,787, Cl. 250-41.9

Pratt & Whitney Inc.: *See—*
Rhodes, Richard P., 3,603,203.

Pray, Lester W.; and Glazener, Carey A., to Maremont Corporation. Improved bobbin cage. 3,603,440, Cl. 193-43.

Precision Sampling Corporation: *See—*
Harris, Rano J., Sr.; and Harris, Rano J., Jr., 3,603,471.

Prelletz, Edward R.; and Rucinski, Roland R., to Bell & Howell Company. Mounting apparatus for web handling machine. 3,603,527, Cl. 242-195.

Press und Stanswerk Craemer, Paul KG: *See—*
Ditges, Ernst, 3,603,272.

Price, Howard; and Szilagyi, Bela, to International Patents & Development Corporation, mesne. Mixer. 3,603,564, Cl. 259-107.

Price, Howard; and Wallick, Seymour, to International Patents & Development Corporation. Refuse compactor. 3,603,247, Cl. 100-139.

Price, Ralph E., to Litton Industries, Inc. Gauge mechanism for grinding machines. 3,603,044, Cl. 51-165.91

Prigent, Raymond: *See—*
Chenault, Roger; Portal, Guy; Porrot, Emile; and Prigent, Raymond,3,603,791.

Pringle, William L.; and Cucheran, John S., to Robbins, Jim Seat Belt Co. Retracting reel assembly. 3,603,525, Cl. 242-107.4

Products Research and Chemical Corporation: *See—*
Cook, Ralph J., 3,603,487.

Produits Chimiques Pechiney-Saint-Gobain: *See—*
Neuville, Bernard; Ledoux, Claude; and Hess, Raoul, 3,602,943.

Promin, Robert M.; and Coutant, Ralph W., to Hewitt-Robins Incorporated. Belt training apparatus. 3,603,451, Cl. 198-202.

Propriete Industrielle et Developpement: *See—*
Seunevel, Jean Jacques; and Veber, Andre, 3,602,917.

Provost, Norwood E. Hinge pintle removing tool. 3,602,969, Cl. 29-275.

Przedsiebiorstwo Specjalistyczne Gornictwa Surowcow Chemicznych: *See—*
Zakiewicz, Bohdan, 3,603,097.
Zakiewicz, Bohdan, 3,603,099.

Purdue Research Foundation: *See—*
Chua, Leon O., 3,603,903.

Quackenbush, Arthur B.: *See—*
Quackenbush, Robert C., 3,603,206.

Quackenbush, Robert C., 1/2 to Quackenbush, Arthur B. Air-hydraulic linear feed device. 3,603,206, Cl. 91-61.

Raaf, Helmut W., to Pfizer Inc. Container for substance incorporating volatiles. 3,603,454, Cl. 206-47.

Rabie, Lee C. Housed electronic component assembly. 3,603,720, Cl. 174-52.

Rabl, Richard, to Akkumulatorenfabrik Dr. Leopole Jungfer, Firma. Cutting devices. 3,603,188, Cl. 83-262.

Rademacher, Robert E.: *See—*
Carnes, Roy W.; Marasso, Fred D.; and Rademacher, Robert E.,3,603,059.

Radiation Sunhouse Limited: *See—*
Reed, Frederick Brydone; and Gardiner, Ernest Eugene, 3,603,013.

Ranzanigo, Pierluigi. Power electric switch. 3,603,755, Cl. 200-153.

Raulins, George Max, to Otis Engineering Corporation. Well tools. 3,603,394, Cl. 166-224.

Raytheon Company: *See—*
Bernstein, Allen; and Miller, Stephen N., 3,603,991.
Briana Anthony, M.; Crain, Arthur; Hatcher, Burrell R.; and Sheldon, Edward J., 3,604,000.

RCA Corporation: *See—*
George, John Barrett, 3,603,732.
Heilmeier, George Harry; and Zanoni, Louis Anthony, 3,603,984.
Lechner, Bernard Joseph, 3,603,962.

Redden, Charles T.: *See—*
Reed, Wallace L.; Reed, James L.; Redden, Charles T.; and Castle, Carl H.,3,603,036.

Reed, Bryant B., to Acushnet Company. Resilient plug for cleaning pipe lines. 3,602,934, Cl. 15-104.06

Reed, Frederick Brydone; and Gardiner, Ernest Eugene, to Radiation Sunhouse Limited. Electric illumination devices. 3,603,013, Cl. 40-106.54

Reed, James L.: *See—*
Reed, Wallace L.; Reed, James L.; Redden, Charles T.; and Castle, Carl H.,3,603,036.

Reed, Karl F., II: *See—*
Eddens, Fletcher C.; and Reed, Karl F., II,3,602,956.

Reed, Lawrence S., Jr.: *See—*
MacArthur, Daivd James; and Reed, Lawrence S., Jr.,3,602,931.

Reed, Marion G., to Chevron Research Company. Formation permeability maintenance with hydroxy-aluminum solutions. 3,603,399, Cl. 166-305.

Reed, W. L., Company: *See—*
Reed, Wallace L.; Reed, James L.; Redden, Charles T.; and Castle, Carl H., 3,603,036.

Reed, Wallace L.; Reed, James L.; Redden, Charles T.; and Castle, Carl H., to Reed, W. L., Company. Rotary abrasive blasting machine. 3,603,036, Cl. 51-13.

Reese, Frank L.; and Dakin, Hayes O., Jr., to Westinghouse Electric Corporation. Contact structure for high-voltage circuit interrupter with liner components. 3,603,754, Cl. 200-148.

Reinemann, Wilfried: *See—*
Geipel, Hans; Forster, Eckehard; Reinemann, Wilfried; and Roychoudhury, Nikhil,3,603,355.

Reinfeld, Kurt; and Goyue, Emmanuel V., to Koppers Company, Inc. Apparatus for bending continuous cast slabs. 3,603,376, Cl. 164-274.

Reins, Edward R., Jr., to Trans-Controls, Inc. Tape buffer system for incremental plotter. 3,603,770, Cl. 235-151.

Remco Industries, Inc.: *See—*
Bart, Philip D.; and Waznys, Peter J., 3,603,030.

Remensperger, Franz; and Schnee, Walter, to Winkler, KG Spezealfalerik fur Backereeraschinen- und Backofen. Equipment for transferring pieces of dough. 3,603,271, Cl. 107-57.

Retzler, William, to Tetra Molectric Limited. Gas burning cigarette lighter. 3,603,709, Cl. 431-131.

Revillet, Georges: *See—*
Arieh, Shimon; and Revillet, Georges,3,603,647.

Reynolds Metals Company: *See—*
Edwards, Joseph N., 3,603,125.

Reynolds, R. J., Tobacco Company: *See—*
Pinkham, Jesse R., 3,603,064.

Reznicek, Raymond A.; Kretchman, Gerald L.; and Stone, Samuel E., to Bendix Corporation, The. Double acting seal for metering valve. 3,603,648, Cl. 303-6.

Rhodes, Richard P., to Pratt & Whitney Inc. Pneumatic tool sensing system for machine tool. 3,603,203, Cl. 90-11.

Richardson, Donald A.: *See—*
Rothenberg, Murray; and Richardson, Donald A.,3,603,659.

Richmond, Stuart; and Exley, David W., to Newton, Chambers & Company Limited. Continuous crystallisation plant. 3,603,103, Cl. 62-124.

Riddle, Kenyon L. Combination cover and trailing sleigh for traction snow vehicles. 3,603,419, Cl. 180-5.
Riffe, William J., to United States Steel Corporation. Pallet. 3,603,273, Cl. 108-58.
Rikuta, Sotokazu. Flow meter of the area type. 3,603,148, Cl. 73-209.
Ringsted Jernstobers & Maskinfabrik A/S Ringsted: *See—*
Odegaard, Magne; and Narmo, Sverre, 3,602,962.
Ripley Company, Inc.: *See—*
Johnson, Allen L., 3,603,968.
Ritzmann, Horst. Apparatus for heat treatment of fine material. 3,603,568, Cl. 263-21.
Riveron, Gabriel, to Societe Flaminaire Marcel Quercia. Lighter having an improved piezo-electric ignition system. 3,603,710, Cl. 431-255.
Robbins, Charles H.; Fitzsimmons, George W.; Hughes, Robert L.; and Moen, Robert L., to General Electric Company. Gas-liquid separator. 3,603,062, Cl. 55-348.
Robbins, Jim Seat Belt Co.: *See—*
Pringle, William L.; and Cucheran, John S., 3,603,525.
Robertshaw Controls Company: *See—*
Good, Arthur L., 3,603,708.
Murrell, Donald K., 3,603,214.
Robertson, H. H., Company: *See—*
Curran, Bernard E., 3,603,057.
Robinson, Joseph D.: *See—*
Umann, Harry M.; and Robinson, Joseph D.,3,602,921.
Robot Foto und Electronic GmbH & Co., KG: *See—*
Maronde, Herbert; and Garitz, Karl Heinz, 3,603,227.
Roche, Rene Robert: *See—*
Wietzel, Antoine Henri; and Roche, Rene Robert,3,603,268.
Rochester Instrument Systems, Inc.: *See—*
Harris, Ben A., 3,603,986.
Roeder, Lyle W.: *See—*
Notes, Robert J., 3,603,460.
Rogers, William C. Aircraft mounted mast for multiple antennae. 3,604,006, Cl. 343-705.
Rohr Corporation: *See—*
Hall, Robert Dale, 3,604,011.
Rollenhagen, David C.; and Poppelbaum, Wolfgang J., to United States of America, Atomic Energy Commission. Digitally controlled ramp generator. 3,603,981, Cl. 340-347.
Rollinson, Stanley: *See—*
Paliyenko, Paul; and Rollinson, Stanley,3,603,043.
Rolls-Royce Limited: *See—*
Billinger, Brian Arthur; MacNamara, Francis Peter; and Cooper, George Samuel, 3,603,090.
Pearson, David Sadler, 3,603,326.
Rombach, Friedrich: *See—*
Kasper, Bernhard O. A.; and Rombach, Friedrich,3,603,503.
Root Harvesters Limited: *See—*
Whitsed, William John, 3,603,404.
Rosendall, Henry J.: *See—*
Morris, William; and Rosendall, Henry J.,3,602,932.
Rosenstern, Franz J., to Koppers Company, Inc. Method for operating basic oxygen furnaces. 3,603,572, Cl. 266-35.
Rosenzweig, Walter: *See—*
Logan, Ralph Andre; Rosenzweig, Walter; and Wiegman, William,3,603,833.
Rotary Profile Anstalt: *See—*
Marcovitch, Jacob, 3,603,226.
Rotating circular wing: *See—*
Brashear, Buddy Joe; Stapleton, Donald Max; and Eskeli, Michael, 3,603,699.
Roth, Abraham H.; and Roth, Dave. Batten seam joint. 3,603,056, Cl. 52-46.
Roth, Dave: *See—*
Roth, Abraham H.; and Roth, Dave,3,603,056.
Roth, Johann: *See—*
Anderl, Peter; Roth, Johann; and Steibl, Theodor,3,603,678.
Rothenberg, Murray; and Richardson, Donald A., to Art Metal-Knoll Corporation. Drawer head for index card file drawers. 3,603,659, Cl. 312-330.
Rousselet, Leroy H. Drain relief valve. 3,603,340, Cl. 137-357.
Rovinski, Robert S.: *See—*
Easton, Roger L.; Bartholomew, Charles A.; and Rovinski, Robert S.,3,603,530.
Roychoudhury, Nikhil: *See—*
Geipel, Hans; Forster, Eckehard; Reinemann, Wilfried; and Roychoudhury, Nikhil,3,603,355.
Royer, Wayne H., to Teledyne, Inc. Oven loading means. 3,603,269, Cl. 107-57.
Royle, Antony Peter: *See—*
Fry, William Lawrence; Royle, Antony Peter; and Darbyshire, Peter,3,603,758.
RST International Metals Limited: *See—*
Swain, Hugh David, 3,603,339.
Rucinski, Roland R.: *See—*
Prelletz, Edward R.; and Rucinski, Roland R.,3,603,527.
Rudd, Charles E.: *See—*
Payne, Jesse W.; and Rudd, Charles E.,3,603,526.
Ruffert, Klaus P., to Myrtle Desk Company. Furniture leg attachment assembly. 3,603,546, Cl. 248-188.
Ruger, Gerd Heinz: *See—*
Jaskulski, Manfred Erich; Ruger, Gerd Heinz; and Wunsch, Wolfgang Kurt,3,603,114.
Ruget, Gabriel, to Compagnie des Ateliers et Forges de la Loire (St-Chamond, Firminy, St.-Etienne Jacob Holtzer). Method of forging blanks, notably crankshafts. 3,603,130, Cl. 72-322.
Russell, Larry D., to United States of America, National Acronautics and Space Administration. High intensity radiant energy pulse source having means for opening shutter when light flux has reached a desired level. 3,603,798, Cl. 250-211.
Rusz, Tibor: *See—*
Levy, Donald; and Rusz, Tibor,3,603,955.
Ryan, John W.; and Shapero, Wallace H. Thermodynamic container. 3,603,106, Cl. 62-457.
Sachse, George E., Jr.: *See—*
Samuelian, Maurice P.; and Sachse, George E., Jr.,3,603,364.
Sackett, A. J., & Sons Company, The: *See—*
Sackett, Walter J., Sr., 3,603,567.
Sackett, Walter J., Sr., to Sackett, A. J., & Sons Company, The. High speed blending and loading system. 3,603,567, Cl. 259-180.
S.A.E.S. Getters S.p.A.: *See—*
Zucchinelli, Mario; and Ferrario, Bruno, 3,603,704.
Sahrbacker, Edward V., to Lucerne Products, Inc. Adjustable switch device. 3,603,757, Cl. 200-157.
Saito, Morio: *See—*
Arimura, Tohru; Kamata, Masamoto; Saito, Morio; and Okamoto, Terumi,3,603,124.
Sakaguchi, Mitsuhito: *See—*
Uchida, Teiji; and Sakaguchi, Mitsuhito,3,603,666.
Salerno, Arthur: *See—*
Murcott, Charles E.; and Salerno, Arthur,3,602,929.
Salzer, Erwin, to Chase-Shawmut Company, The. Multi-fuse-link high-voltage fuse having a link- supporting mandrel and means for equalizing the interrupting duty of the fuse links. 3,603,909, Cl. 337-161.
Samuelian, Maurice P.; and Sachse, George E., Jr., to Dynamics Corporation of America. Liquidizer jar with removable cutter unit. 3,603,364, Cl. 146-68.
Sanchez, Albert. Parking charge display device. 3,603,960, Cl. 340-309.1
Sanders Associates, Inc.: *See—*
Johnson, George L., 3,603,988.
Palleiko, Benjamin, 3,603,999.
Sangen, Masashi: *See—*
Yamada, Heima; Sangen, Masashi; and Nomi, Kazumasa,3,603,841.
Sangster, Frederik Leonard Johan, to U.S. Philips Corporation. Capacitor store. 3,603,808, Cl. 307-221.
Saretzky, Simon, to IMC Magnetics Corporation. Rotor-stator assembly having reduced inertia. 3,603,826, Cl. 310-266.
Sarkozi, Miklos: *See—*
Szabo, Andras I.; and Sarkozi, Miklos,3,603,977.
Sarnezki, Herbert, to Siemens Aktiengesellschaft. Permanent magnetic system for travelling wave tubes. 3,603,908, Cl. 335-210.
Sathicq, Robert: *See—*
Morane, Bruno; Paoletti, Charles; Maurelli, Manlio; Merrien, Louis; and Sathicq, Robert,3,603,483.
Sato, Tai; Takeishi, Yoshiyuki; Okamoto, Yoshihiko; and Hara, Hisashi, to Tokyo Shibaura Electric Co., Ltd. Complementary field-effect type semiconductor device. 3,603,848, Cl. 317-235.
Sauermilch, Rolf: *See—*
Stihl, Hans-Peter; Dolata, Hans; Sauermilch, Rolf; and Lude, Herman,3,603,179.
Saul, Peter: *See—*
Blomeyer, Walter; and Saul, Peter,3,603,601.
Sawagata, Shinichi: *See—*
Tsuneta, Asahide; and Sawagata, Shinichi,3,603,829.
Saylak, Donald; and Johnston, Arch D., to United States of America, Air Force. Method of detecting cracks and measuring strain in polymeric structures. 3,603,142, Cl. 73-88.5
Scaramucci, Domer. Lined disc valve and mold for forming the lining. 3,603,341, Cl. 137-375.
S.C.E.I. Soc. Costuz, Elettrotermiche Industriali, S.p.A.: *See—*
Galeone, Giulio, 3,603,570.
Schabert, Hans-Peter: *See—*
Michael, Horst; and Schabert, Hans-Peter,3,603,383.
Schagen, Pieter: *See—*
Manley, Brian William; Schagen, Pieter; and Adams, John,3,603,832.
Schanck, Gordon J.: *See—*
Lindberg, John E.; McCoy, Darrel V.; Schanck, Gordon J.; and Van Cleef, Harry E., Jr.,3,603,953.
Schantz, John S.: *See—*
Schantz, Socrates J., 3,603,492.
Schantz, Raymond G.: *See—*
Schantz, Socrates J., 3,603,492.
Schantz, Socrates J., 1/3 to Schantz, John S., and 1/3 to Schantz, Raymond G. Needle and thread holder. 3,603,492, Cl. 223-109.
Scherbaum, Friedrich; and Ludwig, Klaus, to Siemens Aktiengesellschaft. Liquid-cooled assembly of disc cells. 3,603,381, Cl. 165-80.
Schilke, Waldemar, to Bata Shoe Company of Canada Limited. Apparatus for roughing the overlasted portions of the bottoms of shoe uppers. 3,603,120, Cl. 69-6.5
Schindler, John K.: *See—*
Goggins, William B., Jr.; and Schindler, John K.,3,603,992.
Schlachter, Herbert J.: *See—*
Stang, Charles, Jr.; and Schlachter, Herbert J.,3,603,504.

Schlitz, Erwin, to International Telephone and Telegraph Corporation. Angular acceleration sensor. 3,603,158, Cl. 73-515.

Schlumberger Technology Corporation: *See—*
Allaud, Louis A., 3,603,795.
Mc Gill, Howard L., 3,603,390.
Mc Gill, Howard L., 3,603,392.
Nelligan, William B., 3,603,923.

Schmaus, Siegfried H. A. Direct-acting pressure and vacuum sensor. 3,603,153, Cl. 73-418.

Schmidt, Kenneth J.; and Lacock, James A., to General Trailer Co. Vehicle load measuring apparatus. 3,603,418, Cl. 177-136.

Schmidtke, Joachim G. Crimping means for sheet feeding apparatus. 3,603,584, Cl. 271-50.

Schnee, Walter: *See—*
Remensperger, Franz; and Schnee, Walter,3,603,271.

Schnellpressenfabrik Frankenthal Albert & Cie, Aktiengesellschaft: *See—*
Moos, Franz; and Loffler, Gerhard, 3,603,256.

Schoeffler, William N. Blowout guillotine. 3,603,387, Cl. 166-55.

Schoenholz, Daniel, to Snell, Foster D., Inc. Paint container. 3,602,939, Cl. 15-257.06

Scholz, William A., to Standum Inc., mesne. Produce wrapper. 3,603,369, Cl. 150-52.

Schomburg, Walter A., to Chicago Etching Corporation. Process of highlighting the indicia on a watchband calendar. 3,603,014, Cl. 40-107.

Schoonover, Richard H. A., to Katrak Vehicle Co. Traction control system for tandem type vehicle wheels. 3,603,423, Cl. 180-74.

Schroer, Charles E.: *See—*
Brown, Jerry A.; and Schroer, Charles E.,3,603,519.

Schubert, Bernhard, to Hauni-Werke Korber & Co. KG. Method and apparatus for the production of composite filter tips. 3,603,058, Cl. 53-126.

Schubert, Howard C., to Aerolite Electronics Corporation. Modular alarm signaling system. 3,603,947, Cl. 340-213.

Schuenemann, Claus H., to International Business Machines Corporation. Bistable device storage cell. 3,603,820, Cl. 307-305.

Schuller, Eduard, to Telefunken Patentverwertungsgesellschaft m.b.H. Reproducing system utilizing round flexible magnetizable recording carrier foils. 3,603,742, Cl. 179-100.2

Schulz, Horst: *See—*
Lutz, Manfred; and Schulz, Horst,3,603,178.

Schulze, Heinz: *See—*
Strehle, Horst; Hennig, Walter; Wiessner, Manfred; and Schulze, Heinz,3,603,234.

Schumacher, William Ludlow, to AMP Incorporated. Electrical connector means having operating means for connecting multiconductor cable means. 3,603,910, Cl. 339-45.

Schutte and Koerting Company: *See—*
Bennett, Leonard Myer; and Cropps, John Edwin, 3,603,146.

Schuttloffel, Erich, to Telefunken Patentverwertungsgesellschaft m.b.H. Symmetrical flexible waveguide. 3,603,905, Cl. 333-95.

Schwartz, Arthur G. Lantern having magnetic lamp focussing and switching. 3,603,783, Cl. 240-10.69

Schwartz, Leonard; and Bevan, Robert K., to Singer-General Precision, Inc. Antenna array system for generating shaped beams for guidance during aircraft landing. 3,604,010, Cl. 343-756.

Schwartz, Robert A. D. Light louver and fastener therefor. 3,602,955, Cl. 24-81.

Schwarz, Karlhans, to Bodenseewerk Geratetechnik GmbH. Gyroscope with collectorless D. C. motor. 3,603,161, Cl. 74-5.6

Schwiebert, Phillip D., to Mac Lean-Fogg Lock Nut Co. Container support and securement structure having collapsible pedestals. 3,603,267, Cl. 105-366.

Schwiebert, Phillip D.; and Norinder, Ivar H., to MacLean-Fogg Lock Nut Co. Coupling link assembly. 3,603,078, Cl. 59-85.

Schwinn Bicycle Company: *See—*
Brilando, Frank P.; and Jameson, Stanley R., 3,603,549.

Scicchitano, Edward A., to Dynotherm Corporation. Isothermal cooking or heating device. 3,603,767, Cl. 219-439.

Scipione, Guisseppe Guerino Vittorio. Hair washing machine. 3,603,320, Cl. 132-7.

Scopp, Howard A.; and Sincock, Thomas F., to Monsanto Company. Coating apparatus. 3,603,286, Cl. 118-64.

Scott, Arthur L., to C/P Corporation. Cross arm assembly. 3,603,717, Cl. 174-45.

Scovil, Henry E. D.: *See—*
Bobeck, Andrew H.; Scovil, Henry E. D.; and Thiele, Alfred A.,3,603,939.

Screws, G.K.M., & Fasteners Limited: *See—*
Kahn, Peter Bruno, 3,603,406.

Seefeld, Le Roy P., to Northrop Corporation. Filler member for joggle joint. 3,603,198, Cl. 85-50.

Seidel, Harold: *See—*
Gyorgy, Ernst M.; Jaeger, Raymond E.; and Seidel, Harold,3,603,899.

Seidelle, James N.: *See—*
Garber, Donovan L.; Seidelle, James N.; and Miles, John R.,3,603,726.

Seiffert, Helmut; and Haeusler, Jochen, to Siemens Aktiengesellschaft. Device for forming workpieces hydroelectrically. 3,603,127, Cl. 72-56.

Seitz, Lamont J., to Baxter Laboratories, Inc. Electronic digital converter. 3,603,969, Cl. 340-347.

Seliber, Boris Abelevich: *See—*
Alexeev, Jury Alexandrovich; Seliber, Boris Abelevich; and Usmanov, Vladimir Bakirovich,3,603,877.

Sellman, Ulf Carl Iwar, to AB Flygmal Air Targer Ltd. Apparatus for recording hit results activated by shock waves energizing hit detectors. 3,603,590, Cl. 273-102.2

Sem-Tec, Inc.: *See—*
Merrill, Samuel E.; and Krosoczka, Joseph D., 3,603,560.

Serrell, John J.; and Sparks, George C., to Parke, Davis & Company, mesne. Pharmacal package construction. 3,603,453, Cl. 206-47.

Seunevel, Jean Jacques; and Veber, Andre, to Propriete Industrielle et Developpement. Glove in plastic or elastic material which may be worn on either hand. 3,602,917, Cl. 2-167.

Sever, Bernard P.: *See—*
Elsworth, John F.; Atkins, Barry; and Sever, Bernard P.,3,603,251.

Seymour, David J.: *See—*
Ursich, Hubert J.; and Seymour, David J.,3,603,016.

Shamban, W. S., & Co.: *See—*
Woodson, Leslie A., 3,603,603.

Shapero, Wallace H.: *See—*
Ryan, John W.; and Shapero, Wallace H.,3,603,106.

Sharp, John Raymond. Pod removal apparatus. 3,603,317, Cl. 130-30.

Shave, Maurice F. Rack for trusses. 3,603,468, Cl. 214-501.

Shearer, Thomas W., Jr., to General Motors Corporation. Hydraulic lock for a linear actuator. 3,603,205, Cl. 91-45.

Sheldon, Edward Emanuel. X-ray image intensifier tube with secondard emission multiplier tunnels constructed to confine the X-rays to individual tunnels. 3,603,828, Cl. 313-65.

Sheldon, Edward J.: *See—*
Briana Anthony, M.; Crain, Arthur; Hatcher, Burrell R.; and Sheldon, Edward J.,3,604,000.

Sheldon, Robert F.: *See—*
Hirsch, James A.; and Sheldon, Robert F.,3,603,852.

Shelnutt, James William, III, to United States of America, Air Force. Scanning scattered light photometer. 3,603,689, Cl. 356-103.

Shelton, Tom. Body supported granular material spreader. 3,603,482, Cl. 222-43.

Shepherd, Freeman D., Jr.; Vickers, Virgil E.; and Yang, Andrew C., to United States of America, Air Force. Schottky barrier photodiode with a degenerate semiconductor active region. 3,603,847, Cl. 317-234.

Shepherd, Larry L., to General Motors Corporation. Step attachment for tractor. 3,603,429, Cl. 182-191.

Sheridan, John J.; Bricker, Gene D.; and Wigner, Donald F., to General Motors Corporation. Winding spool and lead support insulator for rotors of alternating current generators. 3,603,825, Cl. 310-194.

Sherman, Ralph R., Jr.: *See—*
Chase, Robert F.; and Sherman, Ralph R., Jr.,3,603,862.

Sherwin, Harry A.; and Herman, Ronald E. Throttle control. 3,603,297, Cl. 123-97.

Shibata, Seiya; Yamasaki, Akitoshi; and Shimono, Isokazu, to Tsubakimoto Chain Manufacturing Company. Device for clamping a bundle of paper. 3,602,961, Cl. 24-262.

Shimanovsky, Vasily Pavlovich: *See—*
Juzvenko, Jury Arsenievich; Lanina, Tamara Vladimirovna; Shimanovsky, Vasily Pavlovich; Gavrish, Vasily Antonovich; Paschenko, Mark Antonovich; Melnik, Alexandr Vasilievich; Zhurkovsky, Igor Sergeevich; and Vaksin, Moisei Isaakovich,3,603,763.

Shimono, Isokazu: *See—*
Shibata, Seiya; Yamasaki, Akitoshi; and Shimono, Isokazu,3,602,961.

Shinmeiwa Rogyo Kabushiki Kaisha: *See—*
Okazaki, Takashi, 3,603,084.

Shoemaker, Edwin J.: *See—*
Knabusch, Edward M.; and Shoemaker, Edwin J.,3,603,641.

Shoptaugh, Philip L. Board game apparatus. 3,603,591, Cl. 273-131.

Shultz, William E. Wrench. 3,603,181, Cl. 81-90.

Shuman, Norman. Animal leashes. 3,603,295, Cl. 119-109.

SI Handling Systems, Inc.: *See—*
De Oliveira, Egidio Lucas, 3,603,263.

Siebke, Carl O., to Miller Printing Machinery Co. Method and apparatus for sequentially moving dampening rollers. 3,603,254, Cl. 101-148.

Siegel, KennethSiegel, Bernice): *See—*
Koren, Heiman W.; Worontzoff, Nicolas; Siegel, Kenneth; and Klinger, Yehuda,3,603,716.

Siemens Aktiengesellschaft: *See—*
Flachsbarth, Dieter, 3,603,821.
Kumpf, Hermann, 3,603,634.
Michael, Horst; and Schabert, Hans-Peter, 3,603,383.
Neuffer, Ingemar; Eichmann, Dieter; and Langweiler, Frank, 3,603,869.
Sarnezki, Herbert, 3,603,908.
Scherbaum, Friedrich; and Ludwig, Klaus, 3,603,381.
Seiffert, Helmut; and Haeusler, Jochen, 3,603,127.

Signetics Corporation: *See—*
Camenzind, Hans Rudolph; Grebene, Alan Bebin; and Kleitman, David, 3,603,890.

Siler, James H. Power truckle for trailer house. 3,603,467, Cl. 214-334.

Simeau, Bernard Jules Alexandre, to Constructions Radioelectriques et Electroniques du Centre. Amplifying device with wide transmission

band and slight drift enabling a continuous component to be transmitted. 3,603,891, Cl. 330-9.

Sincock, Thomas F.: *See—*
Scopp, Howard A.; and Sincock, Thomas F.,3,603,286.

Singer Company, The: *See—*
Zocher, Josef; and Zimmermann, Heinrich, 3,602,967.

Singer, Irving. Tissue box with adjustable auxiliary bottom. 3,603,452, Cl. 206-45.16

Singer-General Precision, Inc.: *See—*
Schwartz, Leonard; and Bevan, Robert K., 3,604,010.

Sivalls Tanks, inc.: *See—*
Sullivan, Lawrence J., 3,603,101.

Skinner Precision Industries, Inc.: *See—*
Padula, Lawrence D., 3,603,602.

Skromme, Arnold Burton: *See—*
Fickle, J. Clark; Thornbloom, Paul Julius; and Skromme, Arnold Burton,3,603,486.

Smeltzer, John F. Combination fishing bucket. 3,603,019, Cl. 43-21.2

Smith, A. O., Corporation: *See—*
McDonald, William N.; and Hogan, William M., 3,603,517.

Smith, Charles E., to Ward-Turner Machinery Company, The. Latch bar assembly for replaceable cover. 3,602,970, Cl. 29-118.

Smith, Edward A.; and Day, Robert L. Frame connector structure. 3,603,628, Cl. 287-189.36

Smith, Edward C., to Neptune Meter Company. Torque meter. 3,603,144, Cl. 73-136.

Smith, Ian E.: *See—*
Metcalfe, Kenneth A.; and Smith, Ian E.,3,603,851.

Smith, Joseph B., to Pipe Line Development Company, The. Flange coupling repair ring. 3,603,616, Cl. 285-15.

Smith, Millard F. Spill sensors. 3,603,952, Cl. 340-224.

Smith, Peter B., to Dynamics Corporation of America. Magnetic centrifugal switch. 3,603,751, Cl. 200-80.

Smith, Sidney Z.: *See—*
Davenport, Dallas N.; and Smith, Sidney Z.,3,603,006.

Smith-Vaniz, William Reid, to Perkin-Elmer Corporation, The. Alignment apparatus. 3,603,688, Cl. 356-172.

Smulders, August Hendrik Maria. Submarine drilling apparatus. 3,603,408, Cl. 175-6.

Snam Progetti, S.p.A.: *See—*
Parmegiani, Mario; and Clementi, Anacleto, 3,603,085.

Sneeden, Ralph J.; Brookes, Neil R.; and Watts, Hargus,, to Curtiss-Wright Corporation. Combustor for gas turbine having a compressor and turbine passages in a single rotor element. 3,603,082, Cl. 60-39.36

Snell, Foster D., Inc.: *See—*
Schoenholz, Daniel, 3,602,939.

Snow, Frederick O., III.; Connelly, Francis X.; Glazer, Harold; and Latincisics, Nandor K., to Hewitt-Robins Incorporated. Transition structure between conveyor and rotary elevator wheel. 3,603,449, Cl. 198-167.

Snow, Gerald A. Egg carton cells. 3,603,499, Cl. 229-2.5

Societa' Italiana Telecomunicazioni Siemens S.p.A.:*See—*
DeVarda, Giorgio; Martinelli, Saverio; and Perna, Aldo, 3,603,774.

Societe Anonyme D. B. A.: *See—*
Leroux, Roger, 3,603,434.

Societe Anonyme Poclain: *See—*
Gauchet, Yves M., 3,603,614.

Societe Astra de Bouchage: *See—*
Vivier, Georges, 3,603,485.

Societe Flaminaire Marcel Quercia: *See—*
Riveron, Gabriel, 3,603,710.

Sola, Giuseppe, to FIAT Societa per Azioni. Injection pump for internal combustion engines. 3,603,112, Cl. 64-25.

Solartron Electronic Group Limited, The: *See—*
Bailey, Christopher E. G.; and Catherall, Reginald, 3,603,970.

Solby, Robert. Combined television stand and antenna system. 3,604,007, Cl. 343-720.

Somlyody, Arpad, to Burroughs Corporation. Information display circuit including means for blanking the display device. 3,603,965, Cl. 340-324.

Sommonds Precision Products, Inc.: *See—*
Naylor, Vernon G. H., 3,603,906.

Son, Marion O., Jr., to Marathon Oil Company. Fracturing subterranean formations using micellar dispersions. 3,603,400, Cl. 166-308.

Sonntag, George E. Pocketed marble game simulating space travel. 3,603,589, Cl. 273-95.

Sony Corporation: *See—*
Degawa, Jiro; and Takeuchi, Osamu, 3,603,827.

Sotome, Hiromi, to Nippon Gakki Seizo Kabushiki Kaisha. Loudspeaker. 3,603,427, Cl. 181-32.

Space Administration: *See—*
Borkowski, Casimer J.; and Kopp, Manfred K., 3,603,797.

Sparks, George C.: *See—*
Serrell, John J.; and Sparks, George C.,3,603,453.

Spectrol Electronics Corporation: *See—*
Froelich, David B., 3,603,281.

Speedfam Corporation: *See—*
Boettcher, Stephen A., 3,603,042.

Speedy, Guido C.; and Collins, William T., Jr., to General Motors Corporation. Parking, turn signal, and side marker lamp assembly. 3,603,928, Cl. 346-87.

Speigel, Kenneth: *See—*
Gallaro, Anthony V.; Kazuk, Walter F.; and Speigel, Kenneth,3,603,792.
Gallaro, Anthony V.; Kazuk, Walter F.; and Speigel, Kenneth,3,603,830.

Spencer, Glenn S., to Bendix Corporation, The. Positive position brake-clutch. 3,603,437, Cl. 192-53.

Spencer, Richard B., to Sperry Rand Corporation. Graphic vibration resolver. 3,603,140, Cl. 73-71.4

Sperber, Martin, to Squires-Sanders, Inc. Motion detector system which samples only a preselected area. 3,603,729, Cl. 178-6.8

Sperry Rand Corporation: *See—*
Carpentier, Frank J.; and Lins, Stanley J., 3,603,756.
Spencer, Richard B., 3,603,140.

Spier Electronics Inc.: *See—*
Spierer, Theodore L., 3,603,002.

Spierer, Theodore L., to Spier Electronics Inc. Drying apparatus. 3,603,002, Cl. 34-243.

Spisak, Steve, to TRW Inc., mesne. Stud welding tool and stud loading device therefor. 3,603,762, Cl. 219-98.

Spohn, Ralph C.: *See—*
Horne, Edgar J.; and Spohn, Ralph C.,3,603,779.

Spooner, Robert J.: *See—*
Duris, Rudolph M.; and Spooner, Robert J.,3,603,961.

Spradling, Joseph W.; and Kayser, John P., to Air Reduction Company, Incorporated. Intermittent positive pressure breathing device. 3,603,308, Cl. 128-145.8

Spurlin, William V., to FMC Corporation. Weighing apparatus for belt conveyor. 3,603,416, Cl. 177-1.

Square D Company: *See—*
Kindler, Rolf H., 3,603,916.

Squires-Sanders, Inc.: *See—*
Sperber, Martin, 3,603,729.

Staats, William A.; and Baynes, William R., to Mattel, Inc. Electromechanical discharge-charge cycle battery charger. 3,603,861, Cl. 320-14.

Stachl, Martin, to Zeiss-Stiftung, Carl, d/b/a Zeiss, Carl. Microtome with electrical drive. 3,603,189, Cl. 83-412.

Stackpole Carbon Company: *See—*
Bang, Mogens W., 3,603,854.
Bang, Mogens W., 3,603,855.

Stahmer, Bernhardt. Internal combustion engine. 3,603,091, Cl. 60-247.

Stahr, Donald F.; and Yandrick, Rudolph M., to FMC Corporation. Method of and apparatus for machining articles. 3,603,039, Cl. 51-125.

Stampfli, Harald, to Lucifer S.A. Improvements in and relating to an apparatus for adjusting a fluid throughput. 3,603,344, Cl. 137-513.3

Standard Car Truck Company: *See—*
Barber, Franklin D., 3,603,265.

Standard Kollsman Industries Inc.: *See—*
Carlson, Reuben C., 3,603,870.

Standard Pressed Steel Co.: *See—*
Whiteside, Roger B., 3,603,626.

Standum Inc.: *See—*
Scholz, William A., 3,603,369.

Stang, Charles, Jr.; and Schlachter, Herbert J., to Maxitrol Company. Control for direct gas fired makeup air heating. 3,603,504, Cl. 236-10.

Stanley, Robert K., to Techniservice Corporation. Apparatus for draw-crimping textile strands. 3,602,951, Cl. 28-1.2

Stantz, Eugene R., deceased0 (by Stantz, Irene F., executrix). Monitoring device. 3,603,707, Cl. 431-16.

Stantz, Irene F.: *See—*
Stantz, Eugene R.,3,603,707.

Stapleton, Donald Max: *See—*
Brashear, Buddy Joe; Stapleton, Donald Max; and Eskeli, Michael,3,603,699.

Stebley, Frank E. Insert for drilling unit. 3,603,414, Cl. 175-374.

Stedtnitz, Wolfgang Richard Ernst, to Fried, Krupp Gesellschaft mit beschrankter-Haftung. Velocity measuring device. 3,603,920, Cl. 340-3.

Stehouwer, John L. Vehicle safety belt device. 3,603,615, Cl. 280-150.

Steibl, Theodor: *See—*
Anderl, Peter; Roth, Johann; and Steibl, Theodor,3,603,678.

Steigerwalt, George F.: *See—*
Loizides, Edward; and Steigerwalt, George F.,3,603,937.

Stejskal, Bretislav; Stepan, Vladimir; and Vlach, Petr, to Tesla, narodui podnik. Film feeding equipment. 3,603,495, Cl. 226-33.

Stenzel, Wallace I., to Waukee Engineering Co. Apparatus for periodically dispensing a liquid. 3,603,432, Cl. 184-6.

Stepan, Vladimir: *See—*
Stejskal, Bretislav; Stepan, Vladimir; and Vlach, Petr,3,603,495.

Stevens, Michael Charles; and Swatton, Brian David, to Cossor, A. C., Limited. Phase comparator using flip-flop circuits. 3,603,889, Cl. 328-133.

Stihl, Andreas, Maschinenfabrik: *See—*
Stihl, Hans-Peter; Dolata, Hans; Sauermilch, Rolf; and Lude, Herman, 3,603,179.

Stihl, Hans-Peter; Dolata, Hans; Sauermilch, Rolf; and Lude, Herman, to Stihl, Andreas, Maschinenfabrik. Apparatus for sharpening saw chains of motor chain saws. 3,603,179, Cl. 76-25.

Stirling, Hugh R.: *See—*
Grubel, Stanley J.; La Rou, Joseph E.; and Stirling, Hugh R.,3,603,897.
Stockmann, Helmut: *See—*
Decker, Hanns; and Stockmann, Helmut,3,603,516.
Stokes, Leif T.: *See—*
Chamberlain, Leon A.; Campbell, Clarence R.; and Stokes, Leif T.,3,603,450.
Stone, Samuel E.: *See—*
Hughes, Harold W.; and Stone, Samuel E.,3,603,925.
Reznicek, Raymond A.; Kretchman, Gerald L.; and Stone, Samuel E.,3,603,648.
Stouffer, James R., to Cornell Research Foundation, Inc. Sonic inspection method and apparatus. 3,603,303, Cl. 128-2.
Strait, Zdenek: *See—*
Cermak, Antonin; Michalek, Slavomir; and Strait, Zdenek,3,603,706.
Stratton, Michael K., to Caterpillar Tractor Company. Seal assembly. 3,603,618, Cl. 285-31.
Strausberg & Son Co.: *See—*
Ingleright, Paul T., 3,603,223.
Strehle, Horst; Hennig, Walter; Wiessner, Manfred; and Schulze, Heinz, to VEB Pentacon Dresden Kamera- und Kinowerke. Single-lens reflex camera with exposure meter. 3,603,234, Cl. 95-42.
Stripling, William W., to United States of America, Army. Spin stabilized ring-wing canard controlled missile. 3,603,533, Cl. 244-3.23
Stroburg, Clark E.; and Stroburg, Eldon L. Combine. 3,603,063, Cl. 56-14.6
Stroburg, Eldon L.: *See—*
Stroburg, Clark E.; and Stroburg, Eldon L.,3,603,063.
Strogenov, Konstantin Vasilievich: *See—*
Khrenov, Konstantin Konstantinovich; Chudakov, Vyacheslav Andreevich; Strogenov, Konstantin Vasilievich; Kleiman, Vladimir Leonidovich; Fishkis, Mikhail Mironovich; Nikolaev, Vyacheslav Mikhailovich; Kalnishevsky, Vladimir Konmunarovich; and Maltsev, Boris Mikhailovich,3,603,760.
Stromberg Datagraphix, Inc.: *See—*
Hauerbach, Markvard, 3,603,967.
Stumpf, Gunter. Fabric cutting machine. 3,602,990, Cl. 30-276.
Sturm, Jacob H.; and Sturm, Lucille I. Collapsible bag support. 3,603,541, Cl. 248-97.
Sturm, Lucille I.: *See—*
Sturm, Jacob H.; and Sturm, Lucille I.,3,603,541.
Suganuma, Masiayoshi: *See—*
Mori, Miyoshi; and Hyoudou, Miyako, 3,603,693.
Sullivan, Lawrence J., to Sivalls Tanks, inc. Indirect heater. 3,603,101, Cl. 62-52.
Sulzmann, Erich. Roller drainage press for laundry. 3,603,122, Cl. 68-264.
Sun Shipbuilding & Dry Dock Company: *See—*
Griffith, Richard W., 3,603,544.
Superior Continental Corporation: *See—*
Krasin, Lester Q.; and Greene, Clifford E., 3,603,744.
Svensson, Hugo Ragnvald: *See—*
Nurmse, Karl; and Svensson, Hugo Ragnvald,3,603,524.
Svoboda, Vladimir; and Vajda, Andrej, to Elitex, Zavody textilniho strojirenstv generalni reditelstv. Warp knitted pile fabric. 3,603,117, Cl. 66-193.
Swain, Hugh David, to RST International Metals Limited. One-way valve with buoyancy adjustment. 3,603,339, Cl. 137-240.
Swatton, Brian David: *See—*
Stevens, Michael Charles; and Swatton, Brian David,3,603,889.
Sybron Corporation: *See—*
Laessker, Fritz B., 3,603,642.
Sylvania Electric Products, Inc.: *See—*
Gallaro, Anthony V.; Kazuk, Walter F.; and Speigel, Kenneth, 3,603,830.
Jayne, Max L.; and Pihlblad, Robert W., 3,603,915.
Syme, David M.: *See—*
Attwood, Dennis P.; Syme, David M.; and Tuffill, Harold W.,3,603,936.
Szabo, Andras I.; and Sarkozi, Miklos, to Westinghouse Electric Corporation. Digital-to-analog converter utilizing pulse duration modulation. 3,603,977, Cl. 340-347.
Szabo, Gyorgy; and Toth, Sandor, to Licencia Talalmanyokat Ertekesito Vallalat. Apparatus for the manufacture of synthetic leather. 3,602,944, Cl. 18-13.
Szilagyi, Bela: *See—*
Price, Howard; and Szilagyi, Bela,3,603,564.
Taira, Koen: *See—*
Iida, Hirohiko; Kida, Kazuyoshi; and Taira, Koen,3,603,068.
Takahashi, Yuji: *See—*
Hashizume, Toichi; Nagai, Isao; Umeda, Katsuhiko; Otokuni, Tadaaki; and Takahashi, Yuji,3,603,438.
Takayanagi, Kenjiro, to Victor Company of Japan, Limited. Color television picture tube of the single electron gun type. 3,603,839, Cl. 315-13.
Takeishi, Yoshiyuki: *See—*
Sato, Tai; Takeishi, Yoshiyuki; Okamoto, Yoshihiko; and Hara, Hisashi,3,603,848.
Takeuchi, Osamu: *See—*
Degawa, Jiro; and Takeuchi, Osamu,3,603,827.
Takeuchi, Tutaharu, to New Cosmos Electric Company, Limited. Gas alarm device. 3,603,954, Cl. 340-237.
Talley, William A. Jr., to Mobil Oil Corporation. Subsea guideline anchoring method and apparatus. 3,603,386, Cl. 166-0.5
Tan, Sing Liong, to U.S. Philips Corporation, mesne. Colour television camera. 3,603,723, Cl. 178-5.4
Tanaka, Keiji: *See—*
Hirota, Masao; Nakarai, Kazumi; Io, Kenji; Tanaka, Keiji; and Matsuda, Katsuji,3,603,643.
Tanaka, Yutaka: *See—*
Kinugawa, Masao; Ikeda, Masachika; and Tanaka, Yutaka,3,603,727.
Tangel, Frank P., to Buitoni Foods Corporation. Machine for making filled dough products. 3,603,270, Cl. 107-1.
Tanibata, Robert S.: *See—*
Kendall, Robert T.; and Tanibata, Robert S.,3,603,430.
Taniguchi, Takeshi: *See—*
Terada, Kinji; Inariba, Tokuzo; Hiraiwa, Atsumu; and Taniguchi, Takeshi,3,603,073.
Tanner, David E. Rotary valve. 3,603,331, Cl. 137-56.
Taplin, John F. System for processing intelligence in form of binary bars. 3,603,944, Cl. 340-174.1
Tarcrynski, Tadeusz, to United States of America, Air Force. Composite rotor blade retention. 3,603,701, Cl. 416-204.
Techniservice Corporation: *See—*
Stanley, Robert K., 3,602,951.
Teijin Limited: *See—*
Iida, Hirohiko; Kida, Kazuyoshi; and Taira, Koen, 3,603,068.
Teledyne, Inc.: *See—*
Royer, Wayne H., 3,603,269.
Telefunken Patentverwertungsgesellschaft m.b.H.: *See—*
Nosch, Edwin, 3,602,985.
Schuller, Eduard, 3,603,742.
Schuttloffel, Erich, 3,603,905.
Tenneco Inc.: *See—*
Gregg, Paul V., 3,603,131.
Teodorescu, Gheorghe Marcel, to Interprinderea Montaje Conducte Magistrale. Undercarriage trailer for handling and transporting elongated bodies. 3,603,464, Cl. 214-77.
Terada, Kinji; Inariba, Tokuzo; Hiraiwa, Atsumu; and Taniguchi, Takeshi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electric timepiece. 3,603,073, Cl. 58-6.
Terral, Ben D.; and Hardy, Henry W., Jr., to Camco, Incorporated. High pressure well mandrel. 3,603,393, Cl. 166-242.
Tesla, narodui podnik: *See—*
Stejskal, Bretislav; Stepan, Vladimir; and Vlach, Petr, 3,603,495.
Tetra Molectric Limited: *See—*
Retzler, William, 3,603,709.
Texaco Inc.: *See—*
Hoyt, Donald L., 3,603,395.
Vanderford, James R., 3,603,972.
Texas Instruments, Incorporated: *See—*
Brouwer, Jerome J.; Church, Gerald C.; and Morris, Tom C., 3,603,997.
Hair, George D., Jr.; and Haney, William P., 3,603,922.
Isett, Donald D.; and Lomax, John W., 3,603,771.
Ward, Phillip W., 3,603,963.
Textron Inc.: *See—*
Cottrell, Michael J.; and Hudnall, Frederick W., 3,603,625.
Hadfield, Robert W.; and Harding, William H., 3,603,048.
Lindley, Dale C., 3,604,012.
Thaler, Sherwood, to United States of America, National Aeronautics and Space Administration. Current dependent filter inductance. 3,603,864, Cl. 321-10.
Thermo-Systems Inc.: *See—*
Dorman, Frank D., 3,603,147.
Theurillat, Xavier, to Mondia S.A. Timepiece comprising an optical means for indicating the beat of the seconds. 3,603,076, Cl. 58-127.
Thiele, Alfred A.: *See—*
Bobeck, Andrew H.; Scovil, Henry E. D.; and Thiele, Alfred A.,3,603,939.
Thomas & Betts Corporation: *See—*
Kelly, William E., 3,603,912.
Thomas, Carl, to Jurid Werke G.m.b.H. Wire hose clip. 3,602,953, Cl. 24-20.
Thompson, Kenneth L., to Ye Dock Master, Inc. Floating swimming pool. 3,602,925, Cl. 4-171.
Thompson, Tom H., 40% to Mezey, Clifford W. Vehicle suspension apparatus. 3,603,610, Cl. 280-124.
Thornbloom, Paul Julius: *See—*
Fickle, J. Clark; Thornbloom, Paul Julius; and Skromme, Arnold Burton,3,603,486.
Thornton, William E., to Del Mar Engineering Laboratories. Frequeny shift telemetry system with both radio and wire transmission paths. 3,603,881, Cl. 325-30.
Thorstad, Alvin Roger. Toy noise maker. 3,603,028, Cl. 46-114.
Thowless, Eric A., to United States of America, Navy. Tunable moderate-Q transmitting antenna. 3,604,008, Cl. 343-745.
Threadline Fastener Corporation: *See—*
Alexander, L Bruce, 3,603,180.
Thurston, Raymond L.; and Lang, Ronald E. Helical coil insert tool. 3,602,975, Cl. 29-240.5
Tinken Company, The: *See—*
Keller, Thomas C.; and Gegenheimer, Louis H., 3,603,655.
Tinker and Rasor: *See—*
Byerley, Darrel D.; and Fisher, Robert B., 3,603,956.

Tipping, Roderick G.; and Phillips, William V., to General Motors Corporation. Transmission. 3,603,176, Cl. 74-687.
Toda, Tadahide; Nakamura, Norihiko; and Oishi, Kiyohiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Arrangement for controlling discharge of unburnt hydrocarbons from decelerating automobile engine. 3,603,298, Cl. 123-117.
Tokico Ltd.: *See—*
Irie, Yoshihiko; Nishizawa, Mitsunori; and Yamawaki, Shunro, 3,603,480.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Yokota, Mitsuhisa, 3,603,695.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Arimura, Yoshiaki, 3,603,728.
Sato, Tai; Takeishi, Yoshiyuki; Okamoto, Yoshihiko; and Hara, Hisashi, 3,603,848.
Tsuneta, Asahide; and Sawagata, Shinichi, 3,603,829.
Yokota, Mitsuhisa, 3,603,695.
Tomaszewski, Bernd F. O.: *See—*
Hylbert, Edgar W.; Tomaszewski, Bernd F. O.; Kleywegt, Jacob; and Dietl, Hans,3,603,370.
Tomy Kogyo Co., Ltd.: *See—*
Tsugawa, Noriyuki, 3,603,505.
Tonkin, Kenneth J.; and Gallagher, John P., to Dick, A. B., Company. Duplicator program control assembly. 3,603,253, Cl. 101-142.
Tootle, James N., to Pneumo Dynamics Corporation. Bushing-restrictor. 3,603,213, Cl. 92-153.
Toth, Sandor: *See—*
Szabo, Gyorgy; and Toth, Sandor,3,602,944.
Toth, Tibor Endre, to Union Carbide Corporation. Current detector circuit. 3,603,846, Cl. 317-123.
Tournier, Max. Building and interior arrangements thereof. 3,603,047, Cl. 52-30.
Townend, Lionel Henry, to United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's Government of the. Aircraft fluid jet reaction engines. 3,603,094, Cl. 60-261.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Toda, Tadahide; Nakamura, Norihiko; and Oishi, Kiyohiko, 3,603,298.
Trans-Controls, Inc.: *See—*
Reins, Edward R., Jr., 3,603,770.
Trent, Robert L., to United States of America, National Aeronautics and Space Administration. Method of manufacturing semi-conductor devices using refractory dielectrics. 3,602,984, Cl. 29-578.
TRW, Inc.: *See—*
Heflinger, Lee O.; and Wuerker, Ralph F., 3,603,685.
Spisak, Steve, 3,603,762.
Wuerker, Ralph F.; and Heflinger, Lee O., 3,603,662.
Wuerker, Ralph F., 3,603,684.
Tsubakimoto Chain Manufacturing Co., Ltd.: *See—*
Okano, Tohei; and Kannari, Takehiko, 3,603,448.
Tsubakimoto Chain Manufacturing Company: *See—*
Shibata, Seiya; Yamasaki, Akitoshi; and Shimono, Isokazu, 3,602,961.
Tsugawa, Noriyuki, to Tomy Kogyo Co., Ltd. Track assembly for toy vehicles. 3,603,505, Cl. 238-10.
Tsuneta, Asahide; and Sawagata, Shinichi, to Tokyo Shibaura Electric Co., Ltd. In-line type triple electron gun assembly. 3,603,829, Cl. 313-70.
Tuffill, Harold W.: *See—*
Attwood, Dennis P.; Syme, David M.; and Tuffill, Harold W.,3,603,936.
Turico, Richard: *See—*
Ball, Charles W.; and Brodsky, Alexander, 3,603,692.
Turini, Francesco, to Benvenuti, Lamberto, and Morelli, Enrico, d/b/a Industria Calza Toscana Benvenuti & Morelli SNC. Seamless stocking and method of knitting pockets therein. 3,603,116, Cl. 66-187.
Turner, George Christie. Visual display devices. 3,603,837, Cl. 313-220.
Uarco Incorporated: *See—*
Bortolotti, Lawrence R.; and Absler, Howard K., 3,603,681.
Uchida, Teiji; and Sakaguchi, Mitsuhito, to Nippon Selfoc Company, Limited, and Nippon Electric Company, Ltd. Light beam deflection control device with gradient index light guide. 3,603,666, Cl. 350-96.
Uchiyama, Yasuji, to Nippon Gakki Seizo Kabushiki Kaisha. Frequency-divided sawtooth wave generating circuit. 3,603,809, Cl. 307-228.
Ueda, Hiroshi: *See—*
Kobayashi, Tatsuo; Fujii, Yoshifusa; and Ueda, Hiroshi,3,603,781.
Ugo, Gilardelli, to Fabbrica Italiana Magneti Marelli S.p.A. Control means for selective continuous and intermittent operation of electric windshield wipers. 3,603,858, Cl. 318-443.
Uisinger, John E.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,603,892.
Ulmer, Arnold G., to GAF Corporation. Diazo copying machine paper supply roll handling. 3,603,494, Cl. 225-89.
Ulmschneider Laurence A.: *See—*
Kingsley, Charles R.; Kohler, John C.; Lehmann, Robert P.; and Ulmschneider Laurence A.,3,603,528.
Ulyate, John Raymond: *See—*
Morris, Charles William; and Ulyate, John Raymond,3,603,155.
Umann, Harry M.; and Robinson, Joseph D., to World Industries, Inc. Bidet attachment. 3,602,921, Cl. 4-7.
Umeda, Kaoru, to Minolta Camera Kabushiki Kaisha. Counter mechanism in motor-driven camera. 3,603,523, Cl. 242-57.
Umeda, Katsuhiko: *See—*
Hashizume, Toichi; Nagai, Isao; Umeda, Katsuhiko; Otokuni, Tadaaki; and Takahashi, Yuji,3,603,438.
Under Sea Industries, Inc.: *See—*
Bonin, Richard J., Jr., 3,603,306.
Underwood, Donald L.: *See—*
Adams, Max M.; and Underwood, Donald L.,3,603,940.
Uninorm Anstalt: *See—*
Biedermann, Siegfried, 3,603,933.
Union Carbide Corporation: *See—*
Toth, Tibor Endre, 3,603,846.
Williams, Benjamin; and Yendall, Edward F., 3,603,129.
Union Oil Company of California: *See—*
Hallis, Thomas, Jr., 3,603,219.
United Control Corporation: *See—*
Morrow, Jack A., 3,603,159.
United Engineering and Foundry Company: *See—*
Kollen, George P., 3,603,190.
United Kingdom Atomic Energy Authority: *See—*
Kinkead, Alfred Norman, 3,603,141.
United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's Government of the:*See—*
Townend, Lionel Henry, 3,603,094.
United States of America
Air Force: *See—*
Alterman, Robet B., 3,603,733.
Deal, Robert E., 3,604,001.
Dheridon, Nicholas K.; and Kowalski, Daniel C., 3,603,682.
Dunn, Robert G.; and Walk, Emil J., 3,603,959.
Goggins, William B., Jr.; and Schindler, John K., 3,603,992.
Green, Norman F., 3,603,258.
Henderson, Albert G., 3,602,997.
McGee, Roger J., 3,603,859.
Saylak, Donald; and Johnston, Arch D., 3,603,142.
Shelnutt, James William, III, 3,603,689.
Shepherd, Freeman D., Jr.; Vickers, Virgil E.; and Yang, Andrew C., 3,603,847.
Tarcrynski, Tadeusz, 3,603,701.
Weimer, Paul K., 3,603,731.
Army: *See—*
DeRaad, Robert G., 3,603,577.
Koren, Heiman W.; Worontzoff, Nicolas; Siegel, Kenneth; and Klinger, Yehuda, 3,603,716.
McKown, Rss D., 3,603,149.
Milton, Richard S., 3,603,868.
Stripling, William W., 3,603,533.
White, Stanley M.; and Beeker, Charles W., 3,603,257.
Wiese, Harold H., 3,603,020.
Winston, William D., Jr.; and Callahan, John F., 3,603,294.
Atomic Energy Commission: *See—*
Allen, Charles H.; and Leach, Charles E., 3,603,415.
Borkowski, Casimer J.; and Kopp, Manfred K., 3,603,797.
Chase, Robert L., 3,603,796.
Doss, James D.; and Hagerman, Donald C., 3,603,887.
Elliott, Aldelbert J.; and Jones, Milton O., 3,603,107.
Hall, James N., 3,603,813.
Rollenhagen, David C.; and Poppelbaum, Wolfgang J., 3,603,981.
Wells, William M., 3,603,096.
Ying, Shuh-Pan, 3,603,139.
National Aeronautics and Space Administration, Administrator, with respect to an invention of:
Allen, Willis W. Analog-to-digital converter analyzing system. 3,603,772, Cl. 235-153.
Anderson, Tage O. Modular encoder. 3,603,976, Cl. 340-347.
Martin, G. Drexhage. Injection head for delivering liquid fuel and oxidizers. 3,603,092, Cl. 60-258.
Meyer, John A. Altitude sensing device. 3,603,683, Cl. 356-4.
Uisinger, John E., and Lewicki, George W. High voltage transistor amplifier with constant current load. 3,603,892, Cl. 330-18.
National Aeronautics and Space Administration: *See—*
Copeland, Jesse T., Jr., 3,603,974.
Davis, John W.; and Hill, Olen E., 3,602,920.
Girala, Anthony S., 3,602,923.
Graham, Olin L., 3,603,722.
Hard, Thomas M., 3,603,690.
Harms, Volker W., 3,603,532.
National Aeronautics and Space Administration, The: *See—*
Isley, William C.; and Lund, William C., 3,603,093.
National Aeronautics and Space Administration: *See—*
Johnson, Caldwell C., 3,603,260.
Keathley, William H.; and Wesselski, Clarence J., 3,603,433.
La Iacona, Felix P., 3,602,979.
Lee, Robert D., 3,603,946.
Nakanishi, Shigeo, 3,603,088.
Russell, Larry D., 3,603,798.
Thaler, Sherwood, 3,603,864.
Trent, Robert L., 3,602,984.
Navy: *See—*
Bartholomew, Charles A.; and Easton, Roger L., 3,603,885.

Caspers, James W., 3,603,989.
DePackh, David C., 3,603,838.
Easton, Roger L.; Bartholomew, Charles A.; and Rovinski, Robert S., 3,603,530.
Galloway, Richard T.; and Brunk, David H., 3,603,775.
Garber, Donovan L.; Seidelle, James N.; and Miles, John R., 3,603,726.
Howard, Dean D., 3,603,995.
Jones, Dallas W., 3,603,888.
Merel, Wolfgang, 3,603,812.
Oaks, William D., 3,602,978.
Thowless, Eric A., 3,604,008.

United States Steel Corporation: *See—*
Feld, Joseph J., 3,603,165.
Lauterbach, William L., 3,603,375.
Posey, William L., 3,603,874.
Riffe, William J., 3,603,273.

Universal Oil Products Company: *See—*
Lussky, Frederic G., 3,603,051.
McGregor, Eugene R.; and Koji, Alex I., 3,603,638.

Urbigkeit, Walter; Baumann, Karl P. G.; and Ahrens, Guenter, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Clamp for mounting elliptical waveguides. 3,602,960, Cl. 24-249.

Ursich, Hubert J.; and Seymour, David J., said Seymour assor. to said Ursich. Net drum system. 3,603,016, Cl. 43-8.

U.S. Philips Corporation: *See—*
DeBitetto, Dominick John, 3,603,668.
Kooi, Else, 3,602,981.
Kooi, Else, 3,602,982.
Koorneef, Jacob, 3,603,941.
Manley, Brian William; Schagen, Pieter; and Adams, John, 3,603,832.
Molle, Nicolaas Johannes Maria, 3,603,819.
Podraza, George V., 3,603,815.
Sangster, Frederik Leonard Johan, 3,603,808.
Tan, Sing Liong, 3,603,723.

Usmanov, Vladimir Bakirovich: *See—*
Alexeev, Jury Alexandrovich; Seliber, Boris Abelevich; and Usmanov, Vladimir Bakirovich,3,603,877.

Vacu-Maid, Inc.: *See—*
Lindsay, Edward W., 3,602,938.

Vajda, Andrej: *See—*
Svoboda, Vladimir; and Vajda, Andrej,3,603,117.

Vaksin, Moisei Isaakovich: *See—*
Juzvenko, Jury Arsenievich; Lanina, Tamara Vladimirovna; Shimanovsky, Vasily Pavlovich; Gavrish, Vasily Antonovich; Paschenko, Mark Antonovich; Melnik, Alexandr Vasilievich; Zhurkovsky, Igor Sergeevich; and Vaksin, Moisei Isaakovich,3,603,763.

Van Cleef, Harry E., Jr.: *See—*
Lindberg, John E.; McCoy, Darrel V.; Schanck, Gordon J.; and Van Cleef, Harry E., Jr.,3,603,953.

Vanderford, James R., to Texaco Inc. Amplifier system. 3,603,972, Cl. 340-347.

Van Dorst, Cornelius, to Badische Maschinenfabrik G.m.b.H. Apparatus for stacking hides or the like. 3,603,587, Cl. 271-65.

Van Gelder, Harold. Clamp having gripping means. 3,603,580, Cl. 269-42.

Van Loghem, Johannes Jacobus; and La Grouw, Johannes. Wall construction. 3,603,053, Cl. 52-285.

Van Winkle, Edgar W.; Kosakowski, Henry R.; and Hollinger, Walter P., to Bendix Corporation, The. Digital rate generator. 3,603,980, Cl. 340-347.

Varaxin, Alexei Ivanovich: *See—*
Khimich, Georgy Lukich; Niskovskikh, Vitaly Maximovich; Varaxin, Alexei Ivanovich; Gelfenbein, Evgeny Jukhimovich; and Bykov, Vladimir Alexandrovich,3,603,377.

VEB Nakwirkmaschinebau Malimo Karl-Marx-Stadt: *See—*
Jaskulski, Manfred Erich; Ruger, Gerd Heinz; and Wunsch, Wolfgang Kurt, 3,603,114.

VEB Pentacon Dresden Kamera- und Kinowerke: *See—*
Noack, Rolf; and Weise, Johannes, 3,603,229.
Strehle, Horst; Hennig, Walter; Wiessner, Manfred; and Schulze, Heinz, 3,603,234.

Veber, Andre: *See—*
Seunevel, Jean Jacques; and Veber, Andre,3,602,917.

Veeder Industries Inc.: *See—*
Dilger, Lawrence; and Ashford, Ernest S., 3,603,481.

Velzeboer, Pieter Theodor, to N.V. Industrieele Handelscombinate. Suction dredge having endless digger aligned with suction pipe. 3,603,009, Cl. 37-60.

Vereinigte Flugtechnische Werke Fokker GmbH: *See—*
Hupfauf, Lorenz, 3,603,586.

Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft: *See—*
Wogerbauer, Alfred, 3,603,761.

Vernitron Corporation: *See—*
Carlstein, Joseph, 3,603,773.

Verwys, Joseph H. Anti-splash device. 3,603,345, Cl. 137-582.

Vetco Offshore Industries, Inc.: *See—*
Nelson, Bobby H.; and Baugh, Benton F., 3,603,401.

Vickers, Virgil E.: *See—*
Shepherd, Freeman D., Jr.; Vickers, Virgil E.; and Yang, Andrew C.,3,603,847.

Vickers-Zimmer Aktiengesellschaft Planung und Bau von Industrieanlagen: *See—*
Blomeyer, Walter; and Saul, Peter, 3,603,601.

Victor Company of Japan, Limited: *See—*
Takayanagi, Kenjiro, 3,603,839.

Vigor, Charles W.; and Musial, Joseph A., to General Motors Corporation. Peeling machine tool clamp. 3,603,186, Cl. 82-46.

Villa, Carlo: *See—*
Piazzolla, Giovanni; and Villa, Carlo,3,603,351.

Villiger, Rudolf. Writing aid. 3,602,999, Cl. 33-174.

Viltrakis, Douglas V. One-piece clip. 3,603,321, Cl. 132-48.

Virtanen, Valdemar. Ring with resilient ring guard and securing screw. 3,603,109, Cl. 63-15.6

Visual Instruction Systems, Inc.: *See—*
Woodruff, Charles, 3,603,675.

Vitas, John K. Adjustable corrosion resistant pipe hanger. 3,603,538, Cl. 248-59.

Vivier, Georges, 1/2 to Societe Astra de Bouchage. Containers. 3,603,485, Cl. 222-129.

Vlach, Petr: *See—*
Stejskal, Bretislav; Stepan, Vladimir; and Vlach, Petr,3,603,495.

Von Arx, Paul. Tube inspecting vehicle. 3,603,264, Cl. 104-138.

von der Crone, Carl, & Co.: *See—*
Wortmann, Herbert, 3,603,782.

Voran, Willis R. Egg rolling cage bottom wire mesh. 3,603,293, Cl. 119-48.

Vp. Totten, Gilbert, to Cornelius Company, The. Solenoid actuated valve mechanism with lever type operating means. 3,603,559, Cl. 251-138.

Wachholz, Hilton J. Weighing apparatus for wheeled vehicles. 3,603,417, Cl. 177-126.

Wada, Eiichi, to Mondo Kabushiki Kaisha. Magnetic sound recording and reproducing apparatus. 3,603,595, Cl. 274-4.

Wagner, Joseph Robert: *See—*
Lee, Charles Allen; and Wagner, Joseph Robert,3,603,354.

Wagner, Karl; and Huber, Hans-Peter, to Agfa-Gevaert Aktiengesellschaft. Photographic film unit. 3,603,230, Cl. 95-13.

Wagner, William, to Watsco, Inc. Protective hull washer. 3,603,510, Cl. 239-282.

Wahlberg, Eric C. Alarm device for window or door lock. 3,603,958, Cl. 340-274.

Wahle, Gunter: *See—*
Zausch, Wolfgang; and Wahle, Gunter,3,603,445.

Walk, Emil J.: *See—*
Dunn, Robert G.; and Walk, Emil J.,3,603,959.

Walker, Denver L. Shaft truing devices. 3,603,183, Cl. 82-4.

Wallick, Seymour: *See—*
Price, Howard; and Wallick, Seymour,3,603,247.

Walsh, Raymond T., to McDonnell Douglas Corporation. Testing device for light panels. 3,603,778, Cl. 240-2.

Walthard, Beat, to Cerberus AG. Fire alarm installation. 3,603,949, Cl. 340-214.

Ward, Leonard G.; and Mac Neill, John H., to Mohawk Data Sciences Corporation. Matrix Printer with paralled styli and plural coaxial driven coils. 3,603,442, Cl. 147-1.

Ward, Phillip W., to Texas Instruments, Incorporated. Seismic format generator. 3,603,963, Cl. 340-324.

Ward-Turner Machinery Company, The: *See—*
Smith, Charles E., 3,602,970.

Warren, Holland D., to Babcock & Wilcox Company, The. Radiation detector solid state radiation detection using an insulator between the emitter and collector. 3,603,793, Cl. 250-83.1

Watanabe, Hitoshi: *See—*
Hatori, Kozo; Watanabe, Hitoshi; and Yoshida, Nobuyoshi,3,603,900.

Watkins, Bruce J., to Forge, Regan and Engineering Company. Method and apparatus for balancing subsea internal and external well pressures. 3,603,409, Cl. 175-7.

Watsco, Inc.: *See—*
Wagner, William, 3,603,510.

Watson, Louis E.: *See—*
Ingram, Carl B.; and Watson, Louis E.,3,603,508.

Watts, Hargus,: *See—*
Sneeden, Ralph J.; Brookes, Neil R.; and Watts, Hargus,,3,603,082.

Waukee Engineering Co.: *See—*
Stenzel, Wallace I., 3,603,432.

Waznys, Peter J.: *See—*
Bart, Philip D.; and Waznys, Peter J.,3,603,030.

Webb, George, to Avco Corporation. Fuze setback and angular acceleration detent. 3,603,259, Cl. 102-80.

Weber, Charles H., to Maysteel Products Corporation. Means for mounting wiper blades on telescopic machine tool covers. 3,603,651, Cl. 308-3.5

Weber, Edwin J., to Black and Decker Manufacturing Company, The. Cam safe switch actuator. 3,603,065, Cl. 56-16.7

Weber, Josef, to International Standard Electric Corporation. Sealed reed relay. 3,603,907, Cl. 335-151.

Webster, Benjamin C., Jr. Antilift double acting chuck. 3,603,605, Cl. 279-1.

Weeden, Frank G.: *See—*
Pope, Gerald R.; Weeden, Frank G.; and Petrosky, Willard L.,3,602,945.

Weidknecht, John J.: *See—*
Elzey, Patricia I.; and Weidknecht, John J.,3,603,115.
Weight, Wilford A. Trouser and skirt hanger. 3,603,491, Cl. 223-96.
Weigl, John W.; and Hoyt, Hazen L., III, to Xerox Corporation. Photoreceptor assembly. 3,603,730, Cl. 178-7.1
Weimer, Paul K., to United States of America, Air Force, mesne. Difital scanning mosaic photosening system. 3,603,731, Cl. 178-7.1
Weinberger, Arnold, to International Business Machines Corporation. Binary batch adder utilizing threshold counters. 3,603,776, Cl. 235-175.
Weise, Johannes: *See—*
Noack, Rolf; and Weise, Johannes,3,603,229.
Weiss, Paul F.: *See—*
Paine, T. O., Administrator of the National Aeronautics and Space Administration with respect to an invention of,; Wyman, Charles L.; Gould, John M.; Johnson, Robert E.; and Weiss, Paul F.,3,603,686.
Wellhofer, Carl, to Kidde, Walter, & Co., Inc., mesne. Lantern. 3,603,784, Cl. 240-11.2
Wells, William M., to United States of America, Atomic Energy Commission. Apparatus for installing a reinforced vessel in an undergound cavity. 3,603,096, Cl. 61-0.5
Weltha, Marvin D., to Collins Radio Company. Box hold-down device. 3,603,660, Cl. 312-333.
Wenham, Graham J., to Girling Limited. Vehicle levelling systems. 3,603,611, Cl. 280-124.
Wescom, Inc.: *See—*
Beers, Howard L., 3,603,845.
Wesemann, Fred. Ear mold protector. 3,603,309, Cl. 128-152.
Wesselski, Clarence J.: *See—*
Keathley, William H.; and Wesselski, Clarence J.,3,603,433.
Westates Space-Era Products, Inc.: *See—*
Anderson, Frank R.; and Castro, Albert J., 3,603,283.
Western Company of North America, Inc., The: *See—*
Morris, Billy P., 3,603,145.
Western Electric Company: *See—*
Ansell, Willie T.; and McConnell, James C., 3,603,441.
Westfall, James E.: *See—*
Lecinski, Frank H., Jr.; and Westfall, James E.,3,603,472.
Westhaver, Lawrence A. Method for camera shutter timing. 3,603,133, Cl. 73-5.
Westinghouse Air Brake Company: *See—*
Grundy, Reed H., 3,603,876.
Westinghouse Electric Corporation: *See—*
Frink, Russell E., 3,603,752.
Frink, Russell E., 3,603,753.
Reese, Frank L.; and Dakin, Hayes O., Jr., 3,603,754.
Szabo, Andras I.; and Sarkozi, Miklos, 3,603,977.
Westland-Gummiwerke GmbH & Co.: *See—*
Pott, Richard, 3,603,447.
Wheelock, Colin, to Mills Scaffold Company Limited. Adjustable struts. 3,603,552, Cl. 248-354.
Whirlpool Corporation: *See—*
Lampman, William T., 3,603,696.
White, Frederick M., to General Electric Company. Push to release latch friction type. 3,603,631, Cl. 292-220.
White, Gerard, to Bell Telephone Laboratories, Incorporated. Gunn-diode logic circuits. 3,603,818, Cl. 307-260.
White, Robert B.; and Cooke, Charles L., to Brown Engineering Company, Inc., mesne. Apparatus for manufacturing printed circuits. 3,603,329, Cl. 134-107.
White, Stanley M.; and Beeker, Charles W., to United States of America, Army. Fuze safety mechanism. 3,603,257, Cl. 102-64.
Whiteside, Roger B., to Standard Pressed Steel Co. High-strength joint and fastener assembly therefor. 3,603,626, Cl. 287-189.36
Whitsed, William John, to Root Harvesters Limited. Harvesters for roots, tubers and the like. 3,603,404, Cl. 171-9.
Whyte, Ronal H.: *See—*
Brucken, Byron L.; and Whyte, Ronal H.,3,603,118.
Widman, Michael U., to Wooster Brush Company, The. Spring lock for telescoping members. 3,603,623, Cl. 287-58.
Wiegman, William: *See—*
Logan, Ralph Andre; Rosenzweig, Walter; and Wiegman, William,3,603,833.
Wiese, Harold H., to United States of America, Army. Magazine assembly with expendable cartridge container unit. 3,603,020, Cl. 42-50.
Wiessner, Manfred: *See—*
Strehle, Horst; Hennig, Walter; Wiessner, Manfred; and Schulze, Heinz,3,603,234.
Wietzel, Antoine Henri; and Roche, Rene Robert. Pastry making machine for producing crescent rolls. 3,603,268, Cl. 107-4.
Wigner, Donald F.: *See—*
Sheridan, John J.; Bricker, Gene D.; and Wigner, Donald F.,3,603,825.
Wiklund, Bjorn Sture. Track system for wheeled carriages. 3,603,262, Cl. 104-35.
Wilde, Lewis L., to Wilde Manufacturing, Inc. Cucumber-harvesting machine. 3,603,067, Cl. 56-327.
Wilde Manufacturing, Inc.: *See—*
Wilde, Lewis L., 3,603,067.
William Prym-Werke KG.: *See—*
Glindmeyer, Friedrich, 3,602,958.
Williams, Barry E.; and Fitzpatrick, Glenn B., to Hughes Aircraft Company. System for automatically generating smoothing parameters in an automatic track-while-scan radar system. 3,603,994, Cl. 343-7.3
Williams, Benjamin; and Yendall, Edward F., to Union Carbide Corporation. Apparatus for liquid-gas contacting tray. 3,603,129, Cl. 72-324.
Williams, Charles S., to Edmund Scientific Co. Music-responsive light display. 3,603,195, Cl. 84-464.
Williams Patent Crusher & Pulverizer Co., Inc.: *See—*
Williams, Robert M., 3,603,514.
Williams, Robert M., to Williams Patent Crusher & Pulverizer Co., Inc. Scrap reducing and refining apparatus. 3,603,514, Cl. 241-31.
Willimek, Walter: *See—*
Aucktor, Erich; and Willimek, Walter,3,603,111.
Willington, David Everitt: *See—*
Bertioli, Michael Murray; and Willington, David Everitt,3,602,983.
Wilmot-Breeden Limited: *See—*
Clayton, Kenneth Hubert, 3,603,810.
Wilson, Alexander J., to Girling Limited. Hydraulic braking systems for vehicles. 3,603,649, Cl. 303-21.
Wilson, Bernard, to General Electric and English Electric Companies Limited. Phase shift data transmission systems having auxiliary channels. 3,603,882, Cl. 325-47.
Wilson, Betty A. Detachable seat pad for snowmobiles and the like. 3,603,639, Cl. 297-219.
Wilson, Christopher G. S.: *See—*
Davies, Guy E.; and Wilson, Christopher G. S.,3,603,334.
Wilson, Nancy C. Wig case. 3,603,322, Cl. 132-79.
Winberg, Ragnar Olof. Caps for bottles and containers. 3,603,473, Cl. 215-41.
Windham, Edward F., to General Safety Inc. Gate closure device. 3,603,629, Cl. 292-145.
Winkler, Alfred: *See—*
Kremp, Rudolf; and Winkler, Alfred,3,603,233.
Kremp, Rudolf; Friedlaender, Ernst; and Winkler, Alfred,3,603,228.
Winkler, KG Spezealfalerik fur Backereeraschinen- und Backofen: *See—*
Remensperger, Franz; and Schnee, Walter, 3,603,271.
Winschuh, Erich: *See—*
Detert, Klaus; Lipp, Hans-Jochen; and Winschuh, Erich,3,603,143.
Winston, William D., Jr.; and Callahan, John F., to United States of America, Army. Rabbit environmental hood and restrainer. 3,603,294, Cl. 119-103.
Witte, Robert A., to International Telephone and Telegraph Corporation. Polarization diversity radiator for phased arrays. 3,603,987, Cl. 343-786.
Woertz, Hans, to Woertz, Oskar Inh H. & O. Electric power distribution system. 3,603,918, Cl. 339-22.
Woertz, Oskar Inh H. & O.: *See—*
Woertz, Hans, 3,603,918.
Wogerbauer, Alfred, to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft. Apparatus for producing fold flange tubes. 3,603,761, Cl. 219-59.
Wolber, Robert; and Assmus, Friedrich, to Gebruder Junghans G.m.b.H. Device for limiting the alarm time in electric alarm clocks. 3,603,075, Cl. 58-20.
Wood, Gordon G. Truss connector plate. 3,603,197, Cl. 85-13.
Wood Industries, Inc.: *See—*
Horner, Ellwood J., 3,603,255.
Wood, Prentice J., to Mead Corporation, The. Article carrier. 3,603,477, Cl. 220-113.
Woodhead, Robert C., to Canada, Minister of National Defense. Secret signalling system power source. 3,603,734, Cl. 179-1.5
Woodruff, Charles, deceased0 (by Woodruff, Ehel; executrix), to Visual Instruction Systems, Inc. Motion picture film reproducing apparatus and method with provision for translation of stop-motion coding. 3,603,675, Cl. 352-56.
Woodruff, Ehel: *See—*
Woodruff, Charles,3,603,675.
Woodson, Leslie A., to Shamban, W. S., & Co. Rotating seal assembly. 3,603,603, Cl. 277-165.
Wooster Brush Company, The: *See—*
Widman, Michael U., 3,603,623.
World Industries, Inc.: *See—*
Umann, Harry M.; and Robinson, Joseph D., 3,602,921.
Worontzoff, Nicolas: *See—*
Koren, Heiman W.; Worontzoff, Nicolas; Siegel, Kenneth; and Klinger, Yehuda,3,603,716.
Wortmann, Herbert, von der Crone, Carl, & Co. Combined tool holder and flashlight. 3,603,782, Cl. 240-6.46
Woschetzky, Werner; and Paul, Gerard T., to Perkin-Elmer Corporation, The. Apparatus for converting between digital and analog information. 3,603,971, Cl. 340-347.
Wright, Charles E.; and Gunyou, John, to E. S. & A. Robinson (Canada) Limited. Method of forming a bag. 3,603,217, Cl. 93-35.
Wright, Lee A., to Mosier Industries, Inc. Valve improvements. 3,603,348, Cl. 137-625.64
Wroblewski, Edward J.: *See—*
Barbeau, Raymond A.; and Wroblewski, Edward J.,3,602,940.
Wuerker, Ralph F., to TRW Inc. Recording holograms of objects with range contours. 3,603,684, Cl. 356-109.

Wuerker, Ralph F.; and Heflinger, Lee O., to TRW Inc. Two-beam, wide-viewing-angle holographic apparatus. 3,603,662, Cl. 350-3.5

Wuerker, Ralph F.: *See—*
Heflingzr, Lee O.; and Wuerker, Ralph F.,3,603,685.

Wunsch, Wolfgang Kurt: *See—*
Jaskulski, Manfred Erich; Ruger, Gerd Heinz; and Wunsch, Wolfgang Kurt,3,603,114.

Wyman, Charles L.: *See—*
Paine, T. O., Administrator of the National Aeronautics and Space Administration with respect to an invention of,; Wyman, Charles L.; Gould, John M.; Johnson, Robert E.; and Weiss, Paul F.,3,603,686.

Wyss, Andre, to La Beroche SA. Foldable bed. 3,602,927, Cl. 5-112.

Xerox Corporation: *See—*
Barton, Edward D., 3,603,680.
Moore, Ralph C., 3,603,935.
Weigl, John W.; and Hoyt, Hazen L., III, 3,603,730.

Yamada, Heima; Sangen, Masashi; and Nomi, Kazumasa, to Matsushita Electronics Corporation. Fluorescent lamp device with luminosity control. 3,603,841, Cl. 315-171.

Yamasaki, Akitoshi: *See—*
Shibata, Seiya; Yamasaki, Akitoshi; and Shimono, Isokazu,3,602,961.

Yamauchi, Takao, to Nippon Gakki Seizo Kabushiki Kaisha. Knee-lever device or arrangement for electronic musical instruments. 3,603,170, Cl. 74-515.

Yamawaki, Shunro: *See—*
Irie, Yoshihiko; Nishizawa, Mitsunori; and Yamawaki, Shunro,3,603,480.

Yandrick, Rudolph M.: *See—*
Stahr, Donald F.; and Yandrick, Rudolph M.,3,603,039.

Yang, Andrew C.: *See—*
Shepherd, Freeman D., Jr.; Vickers, Virgil E.; and Yang, Andrew C.,3,603,847.

Yann, Jack. Tubing anchor. 3,603,391, Cl. 166-212.

Ye Dock Master, Inc.: *See—*
Thompson, Kenneth L., 3,602,925.

Yearley, Douglas C., to Phelps Dodge Copper Products Corporation. Continuous casting with circular trough mold. 3,603,378, Cl. 164-283.

Yendall, Edward F.: *See—*
Williams, Benjamin; and Yendall, Edward F.,3,603,129.

Ying, Shuh-Pan, to United States of America, Atomic Energy Commission. Pulsed acoustic image converter. 3,603,139, Cl. 73-67.9

Yokota, Mitsuhisa, to Tokyo Shibaura Denki Kabushiki Kaisha, a/k/a Tokyo Shibaura Electric Co., Ltd. Bleeder and back-pressure turbine control system. 3,603,695, Cl. 415-17.

Yorkshire Industries, Inc.: *See—*
Henry, Robert R., 3,603,163.

Yoshida, Nobuyoshi: *See—*
Hatori, Kozo; Watanabe, Hitoshi; and Yoshida, Nobuyoshi,3,603,900.

Youden, David H., to Heald Machine Company, The. Siide bearings for machine tool way. 3,603,652, Cl. 308-9.

Yurdin, Alfred. Apparatus for cleaning smokers' pipes. 3,603,318, Cl. 131-244.

Zahuranec, Emery J., to Crawford Fitting Company. Temperature sensitive fitting. 3,603,280, Cl. 116-114.5

Zakiewicz, Bohdan, to Przedsiebiorstwo Specjalistyczne Gornictwa Surowcow Chemicznych. Process of making underground structures for underdraining and shielding purposes. 3,603,097, Cl. 61-11.

Zakiewicz, Bohdan, to Przedsiebiorstwo Specjalistyczne Gornictwa Surowcow Chemicznych. Process of making intraground waterproof baffles and a device therefor. 3,603,099, Cl. 61-72.1

Zanoni, Louis Anthony: *See—*
Heilmeier, George Harry; and Zanoni, Louis Anthony,3,603,984.

Zaura, Paul J., Jr; Hawkins, George C.; and Cannalte, Gary A., to Motorola, Inc. Speech/noise discriminating constant pulse width squelch. 3,603,884, Cl. 325-348.

Zausch, Wolfgang; and Wahle, Gunter, to Hauni-Werke, Korber & Co. KG. Apparatus for manipulating rod-shaped articles. 3,603,445, Cl. 198-31.

Zeiss, Carl: *See—*
Stachl, Martin, 3,603,189.

Zeiss-Stiftung, Carl: *See—*
Stachl, Martin, 3,603,189.

Zhurkovsky, Igor Sergeevich: *See—*
Juzvenko, Jury Arsenievich; Lanina, Tamara Vladimirovna; Shimanovsky, Vasily Pavlovich; Gavrish, Vasily Antonovich; Paschenko, Mark Antonovich; Melnik, Alexandr Vasilievich; Zhurkovsky, Igor Sergeevich; and Vaksin, Moisei Isaakovich,3,603,763.

Ziegler, Frank L. Educational game board assembly. 3,603,003, Cl. 35-9.

Ziemek, Gerhard Karl: *See—*
Eilhardt, Bernd; and Ziemek, Gerhard Karl,3,603,715.

Zimmermann, Heinrich: *See—*
Zocher, Josef; and Zimmermann, Heinrich,3,602,967.

Zocher, Josef; and Zimmermann, Heinrich, to Singer Company, The, mesne. Twin action felting machine. 3,602,967, Cl. 28-4.

Zucchinelli, Mario; and Ferrario, Bruno, to S.A.E.S. Getters S.p.A. Radiant heat reflection in devices such as getter pumps. 3,603,704, Cl. 417-51.

Zurstadt, Herbert J., to Dresser Industries, Inc., mesne. Gas adsorption thermometer. 3,603,151, Cl. 73-368.6

LIST OF DESIGN PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF SEPTEMBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AMF Inc.: *See*—
Simpkins, Terry J. 221,808.

A.M.S. Corp.: *See*—
Starck, Arthur M. and W. R. 221,742.

Acme-Hamilton Mfg. Corp.: *See*—
Bauman, Joseph F., and Cini. 221,759.

Adomaitis, Domas, and H. M. Turner, to Continental Can Co., Inc. Bottle. 221,733, 9–7–71, Cl. D9—111.

Allastics, Inc.: *See*—
Holdredge, Ernest C., and Marifjeren. 221,745.

American Can Co.: *See*—
Jacobs, Edward C., and Pillnik. 221,736.
Lapidus, Paul A., and Melind. 221,732.
Lapidus, Paul A., and Melind. 221,734.
Rheinhart, Richard C. 221,737.

American Dairy Queen Corp.: *See*—
Hight, James T. 221,738.
Hight, James T. 221,739.
Hight, James T. 221,740.
Hight, James T. 221,741.

American Standard Inc.: *See*—
Van Skyhawk, Norman. 221,760.

Anchor Hocking Corp.: *See*—
Schaefer, Howard A. 221,800.
Schweickart, Jay F. 221,815.

Annesley, Robert H., to Stuckey and Speer, Inc. Ring. 221,797, 9–7–71, Cl. D45—10.

Appel, Mel, and M. Schnur, to Genco-Ware Inc. Condiment shaker. 221,794, 9–7–71, Cl. D44—22.

Architectural Fiberglass: *See*—
Deeds, Douglas, and Rosengrant. 221,776.
Deeds, Douglas, and Rosengrant. 221,779.

Atlanta Stove Works, Inc.: *See*—
Bryan, Robert M. 221,816.
Wilkinson, Judkins E. 221,761.

Baker, Robert G.: *See*—
Le Blanc, George T. and C. H., Balmer and Hurst. 221,769.
Rosen, Samuel R., Reighard, Baker, and Blazey. 221,728.

Balmer, Thomas A.: *See*—
Le Blanc, George T. and C. H., Balmer, and Hurst. 221,770.
Le Blanc, George T. and C. H., Balmer, and Hurst. 221,771.

Bauman, Joseph F., and A. V. Cini, to Acme-Hamilton Mfg. Corp. Corrugated tubing. 221,759, 9–7–71, Cl. D23—45.

Beaver, Ted L., to Continental Can Co., Inc. Bottle or similar article. 221,731, 9–7–71, Cl. D9—40.

Bedol, Alan, to The Marshallan Mfg. Co. 3-tier patio table. 221,780, 9–7–71, Cl. D33—14.

Bell Telephone Laboratories, Inc.: *See*—
Genaro, Donald M., McGarvey, Stokes, and Sylvester. 221,767.
Genaro, Donald M., Grote, McGarvey, and Stokes. 221,821.

Benjamin, E. Burton, to Wrightway Engineering Co. Spray aerator. 221,756, 9–7–71, Cl. D23—35.

Blazey, Lawrence E.: *See*—
Rosen, Samuel R. Reighard, Baker, and Blazey. 221,728.

Bloomfield, Harold, and M. F. Roberts, to Bloomfield Industries, Inc. Wheeled cart. 221,748, 9–7–71, Cl. D14—3.

Bloomfield Industries, Inc.: *See*—
Bloomfield, Harold, and Roberts. 221,748.

Boggs, Alben C., and J. R. Nelis, to Emerson Electric Co. Electric space heater. 221,762, 9–7–71, Cl. D23—111.

Boothby, Alfons, and G. Joseph, to Olympia Werke A.G. Calculating machine. 221,806, 9–7–71, Cl. D64—11.

Brewer, William R. Bath bench. 221,752, 9–7–71. Cl. D15—8.

Brown, Ernest: *See*—
Shelkofsky, Clifford I., Wiener, Wittner, and Brown. 221,772.
Shelkofsky, Clifford I., Wiener, Wittner, and Brown. 221,773.

Bryan, Robert M., to Atlanta Stove Works, Inc. Cooking grill. 221,816, 9–7–71, Cl. D81—10.

Caigan, Robert A., and G. Loewenstein. Table. 221,781, 9–7–71, Cl. D33—14.

Callaham, Michael D. Fire truck. 221,746, 9–7–71, Cl. D14—3.

Candle World: *See*—
Reiher, Wilfred L. 221,811.

Canon Kabushiki Kaisha: *See*—
Ikuta, Tamao, and Moriya. 221,774.

Carroll, John R.: *See*—
Kiniry, John M., Firazzo, and Carroll. 221,810.

Cetrone, Vincent B., and A. J. Sopko, to Warren Industrial Mfg. & Sales Co. Pallet. 221,744, 9–7–71, Cl. D14—3.

Chardack, William M., to Medtronic, Inc. Implantable medical-electronic circuitry. 221,818, 9–7–71, Cl. D83—1.

Chardack, William M., to Medtronic, Inc. Implantable medical-electronic circuitry. 221,819, 9–7–71, Cl. D83—1.

Chi, Yiu D., to Forda Mfg. Co. Ltd. Combined mixer and dispenser. 221,791, 9–7–71, Cl. D44—1.

Cini, Adrian V.: *See*—
Bauman, Josef F., and Cini. 221,759.

Commoden Ltd.: *See*—
Ishag, Zaki. 221,785.

Continental Can Co., Inc.: *See*—
Adomaitis, Domas, and Turner. 221,733.
Beaver, Ted L. 221,731.

Corning Glass Works: *See*—
De Puy, Ronald G. 221,793.
Greger, Richard W. 221,796.

Cunningham, Kenneth O., and R. Montgomery. Sleeper van. 221,743, 9–7–70, Cl. D14—3.

Dean Industries, Ltd.: *See*—
Hutchison, Dean. 221,817.

Deeds, Douglas, and B. L. Rosengrant, to Architectural Fiberglass. Bookcase. 221,776, 9–7–71, Cl. D33—2.

Deeds, Douglas, and B. L. Rosengrant, to Architectural Fiberglass. Desk 221,779, 9–7–71, Cl. D33—7.

De Puy, Ronald G., to Corning Glass Works. Candle warmer or the like. 221,793, 9–7–71, Cl. D44—10.

Diffrient, Niels: *See*—
Downey, William P., Hunger, and Diffrient. 221,750.

Douglas, Bobby E. Headgear for wrestlers. 221,724, 9–7–71, Cl. D2—232.

Downey, William P., R. H. Hunger, and N. Diffrient, to Hyster Co. Overhead guard. 221,750, 9–7–71, Cl. D14—27.

Ebsco Industries, Inc.: *See*—
Leath, William S. 221,814.

Emerson Electric Co.: *See*—
Boggs, Alben C., and Nelis. 221,762.

Erickson, Herman E. Planter base for yard light pole. 221,788, 9–7–71, Cl. D35—3.

Erickson, Oscar E. Hand operated weed cutter. 221,727, 9–7–71, Cl. D8—7.

Fabein, Henri, to Societe Anonyme Automobiles Citroen. Vehicle. 221,747, 9–7–71, Cl. D14—3.

Finazzo, Anthony: *See*—
Kiniry, John M., Finazzo, and Carroll. 221,810.

Forda Mfg. Co. Ltd.: *See*—
Chi, Yiu D. 221,791.

Gale, John A., and D. D. Heinz. Rolling toy. 221,784, 9–7–71, Cl. D34—15.

Genaro, Donald M., J. N. McGarvey, R. R. Stokes, and G. E. Sylvester, to Bell Telephone Laboratories, Inc. Telephone desk stand. 221,767, 9–7–71, Cl. D26—14.

Genaro, Donald M. W. W. Grote, J. N. McGarvey, and R. R. Stokes, to Bell Telephone Laboratories, Inc. Carrying case. 221,821, 9–7–71, Cl. D87—1.

General Electric Co.: *See*—
Maliskas, John S. 221,775.

Genco-Ware Inc.: *See*—
Appel, Mel, and Schnur. 221,794.

Gilbertson, John E. Combined air purifier and deodorizer. 221,763, 9–7–71, Cl. D23—149.

Gorham Division of Textron Inc.: *See*—
Price, James R. 221,803.

Greger, Richard W., to Corning Glass Works. Coffee maker. 221,796, 9–7–71, Cl. D44—26.

Grote, Walter W.: *See*—
Genaro, Donald M., Grote, McGarvey, and Stokes. 221,821.

Hartley, Richard S., to The Hobart Mfg. Co. Speed increaser attachment for food machines. 221,804, 9–7–71, Cl. D55—1.

Hayne, Walter F. Flexible ball projector toy or similar article. 221,786, 9–7–71, Cl. D34—15.

Heinz, Donald D.: *See*—
Gale, John A., and Heinz. 221,784.

Hight, James T., to American Dairy Queen Corp. Food service building. 221,738, 9–7–71, Cl. D13—1.

Hight, James T., to American Dairy Queen Corp. Food service building. 221,739, 9–7–71. Cl. D13—1.

Hight, James T., to American Dairy Queen Corp. Food service building. 221,740, 9–7–71, Cl. D13—1.

Hight, James T., to American Dairy Queen Corp. Food service building. 221,741, 9–7–71, Cl. D13—1.

Hobart Mfg. Co., The: *See*—
Hartley, Richard S. 221,804.

Holdredge, Ernest C., and L. L. Marifjeren, to Allastics, Inc. Pallet. 221,745, 9–7–71, Cl. D14—3.

Hudson Wire Co.: *See*—
Zecchin, Guido. 221,801.

Hunger, Richard H.: *See*—
Downey, William P., Hunger, and Diffrient. 221,750.

Hurst, Bobbie G.: *See*—
Le Blanc, George T. and C. H., Balmer, and Hurst. 221,770.
Le Blanc, George T. and C. H., Balmer, and Hurst. 221,771.

Hutchison, Dean, to Dean Industries, Ltd. Fish frying range. 221,817, 9–7–71, Cl. D81—10.

Hyster Co.: *See*—
Downey, William P., Hunger, and Diffrient. 221,750.

Ikuta, Tamao, and S. Moriya, to Canon Kabushiki Kaisha. Cartridge used for recording and reproducing. 221,774, 9–7–71, Cl. D26—14.

Imperial Products, Inc.: *See*—
Kleves, Raymond. 221,822.

International Business Machines Corp.: *See*—
Shelkofsky, Clifford I. Wiener, Wittner, and Brown. 221,772.
Shelkofsky, Clifford I. Wiener, Wittner, and Brown. 221,773.
Invicta Societe Anonyme: *See*—
Kolbrener, Jack. 221,789.
Ishag, Zaki, to Commoden Ltd. Toy blow pipe, 221,785, 9–7–71, Cl. D34—15.
Jacobs, Edward C., and B. F. Pilinik, to American Can Co. Pull tab for a container. 221,736, 9–7–71, Cl. D9—256.
Jenks, Albert E. Pot holder. 221,795, 9–7–71, Cl. D44—29.
Johnson, Charles B. Adjustable footrest for beds. 221,726, 9–7–71, Cl. D5—4.
Johnson, Ernest R. Table fountain. 221,755, 9–7–71, Cl. D23—13.
Johnson, Marion E. Lamp. 221,799, 9–7–71, Cl. D48—20.
Johnston, Reece W., to Unitek Corp. Dental unit. 221,764, 9–7–71, Cl. D24—1.
Johnston, Reece W., to Unitek Corp. Dental unit. 221,765, 9–7–71, Cl. D24—1.
Joseph, Georg: *See*—
Boothby, Alfons, and Joseph. 221,806.
Kieves, Raymond, to Imperial Products, Inc. Clothing brush. 221,822, 9–7–71, Cl. D86—13.
Kiniry, John M., A. Finazzo, and J. R. Carroll, to Tri-Vec, Inc. Traffic signal. 221,810, 9–7–71, Cl. D72—1.
Koga, Haruhiro: *See*—
Mishiro, Benito, and Koga. 221,805.
Kolbrener, Jack, to Invicta Societe Anonyme. Watch, 221,789, 9–7–71, Cl. D42—8.
Kronish, Donald P., and L. S. Zuriff, to Warner-Lambert Pharmaceutical Co. Bacteriuria test device. 221,751, 9–7–71, Cl. D16—1.
Lapidus, Paul A., and J. E. Melind, to American Can Co. Bottle. 221,732, 9–7–71, Cl. D9—41.
Lapidus, Paul A., and J. E. Melind, to American Can Co. Bottle. 221,734, 9–7–71, Cl. D9—16.
Learned, Addison W., III, and R. C. Slide rule. 221,802, 9–7–71, Cl. D52—6.
Learned, Rosalie C.: *See*—
Learned, Addison W., III, and R. C. 221,802.
Leath, William S., to Ebsco Industries, Inc. Merchandise display stand. 221,814, 9–7–71, Cl. D80—9.
Le Blanc, Clifford H.: *See*—
Le Blanc, George T. and C. H., Balmer, and Hurst. 221,769.
Le Blanc, George T. and C. H., Balmer, and Hurst. 221,770.
Le Blanc, George T. and C. H., Balmer, and Hurst. 221,771.
Le Blanc, George T. and C. H., T. A. Balmer, and B. G. Hurst; said Balmer and said Hurst assignors to George T. Le Blanc and Clifford H. Le Blanc. Portable shower. 221,769, 9–7–71, Cl. D23—57.
Le Blanc, George T. and C. H., T. A. Balmer, and B. G. Hurst; said Balmer and said Hurst assignors to George T. Le Blanc and Clifford H. Le Blanc. Portable shower. 221,770, 9–7–71, Cl. D23—57.
Le Blanc, George T. and C. H., T. A. Balmer, and B. G. Hurst; said Balmer and said Hurst assignors to George T. Le Blanc and Clifford H. Le Blanc. Portable shower. 221,771, 9–7–71, Cl. D23—57.
Locatelli, John D. Marking wheel attachment for an ink marker. 221,812, 9–7–71, Cl. D74—13.
Loewenstein, Gideon: *See*—
Calgan, Robert A., and Loewenstein. 221,781.
Lovecraft Boat Co.: *See*—
Love, Dale E. 221,809.
Love, Dale E., to Lovecraft Boat Co. Paddle wheel boat. 221,809, 9–7–71, Cl. D71—1.
MacManus, John. Forcing bag for decorating pastry and the like. 221,735, 9–7–71, Cl. D9—194.
Maliskas, John S., to General Electric Co. Combined radio and cassette tape recorder or similar article. 221,775, 9–7–71, Cl. D26—14.
Marietta, James W., Jr. A clip for sealing packages and the like. 221,730, 9–7–71, Cl. D8—266.
Marifjeren, Larry L.: *See*—
Holdredge, Ernest C., and Marifjeron. 221,745.
Marshallan Mfg. Co., The: *See*—
Bedol, Alan. 221,780.
Matsushita Electric Industrial Co., Ltd.: *See*—
Mishiro, Benito, and Koga. 221,805.
Mazure, Miguel R. Smoking stand. 221,820, 9–7–71, Cl. D85—2.
McGarvey, John N.: *See*—
Genaro, Donald M., McGarvey, Stokes, and Sylvester. 221,767.
Genaro, Donald M., Grote, McGarvey, and Stokes. 221,821.
Medtronic, Inc.: *See*—
Chardack, William M. 221,818.
Chardack, William M. 221,819.
Melind, Jay E.: *See*—
Lapidus, Paul A., and Melind. 221,732.
Lapidus, Paul A., and Melind. 221,734.
Merritt, Robert E., to Renfro Hosiery Mills Co. Panty hose sizing form. 221,798, 9–7–71, Cl. D47—5.
Meyers, Frank. Weighted flotation water barrier end panel. 221,807, 9–7–71, Cl. D71—1.
Mishiro, Benito, and H. Koga, to Matsushita Electric Industrial Co., Ltd. Combined radio receiver and clock or similar article. 221,805, 9–7–71, Cl. D56—4.
Moffatt, Glenn M., and A. T. Thomas, to Sanson Dominion Ltd. Beater. 221,792, 9–7–71, Cl. D44—1.
Montgomery, Ray: *See*—
Cunningham, Kenneth O., and Montgomery. 221,743.
Moriya, Shozo: *See*—
Ikuta, Tamao, and Moriya. 221,774.
Mueller Co.: *See*—
Smith, John J. 221,753.
Smith, John J. 221,754.
Mullins, John W. Valve receiving tubing clamp. 221,757, 9–7–71, Cl. D23—40.
Mullins, John W. Valve receiving tubing clamp. 221,758, 9–7–71, Cl. D23—40.
Nelis, Joseph R.: *See*—
Boggs, Alben C., and Nelis. 221,762.
Nordson Corp.: *See*—
Rosen, Samuel R., Reighard, Baker, and Blazey. 221,728.
Olympia Werke A.G.: *See*—
Boothby, Alfons, and Joseph. 221,806.
Patrick, Allan M. Invertable rotatable display stand. 221,813, 9–7–71, Cl. D80—9.
Pilinik, Burton F.: *See*—
Jacobs, Edward C., and Pilinik. 221,736.
Price, James R., to Gorham Division of Textron Inc. Spoon or similar article. 221,803, 9–7–71, Cl. D54—12.
Quaker Oats Co., The: *See*—
Topalis, Stylianos A. 221,723.
Reighard, Alan B.: *See*—
Rosen, Samuel R., Reighard, Baker, and Blazey. 221,728.
Reiher, Wilfred L., to Candle World. Candle. 221,811, 9–7–71, Cl. D73—1.
Renfro Hosiery Mills Co.: *See*—
Merritt, Robert E. 221,798.
Reynolds, Don J. Side panel for camping cover for pick-up trucks. 221,749, 9–7–71, Cl. D14—6.
Rheinhart, Richard C., to American Can Co. Handle for a container. 221,737, 9–7–71, Cl. D9—291.
Roberts, Melvin F.: *See*—
Bloomfield, Harold, and Roberts. 221,748.
Rogers, William C. Aircraft radio antenna. 221,766, 9–7–71, Cl. D26—14.
Rose, Herbert M. Article holder for use on a desk. 221,777, 9–7–71, Cl. D33—3.
Rosen, Samuel R., A. B. Reighard, R. G. Baker, and L. E. Blazey, to Nordson Corp. Adhesive dispensing gun. 221,728, 9–7–71, Cl. D8—30.
Rosengrant, Barry L.: *See*—
Deeds, Douglas, and Rosengrant. 221,776.
Deeds, Douglas, and Rosengrant. 221,779.
Rucker, Dale C. Plastic flowers window planter. 221,787, 9–7–71, Cl. D35—3.
Sanson Dominion Ltd.: *See*—
Moffatt, Glen M., and Thomas. 221,792.
Savedra, John, to Tek Plastics Ltd. Infant's bathtub. 221,768, 9–7–71, Cl. D23—52.
Schaefer, Howard A., to Anchor Hocking Corp. Fluted convexo-aspheric lens. 221,800, 9–7–71, Cl. D48—32.
Schellens, Henricus F. T., to U.S. Philips Corp. Mixer. 221,790, 9–7–71, Cl. D44—1.
Schnur, Martin: *See*—
Appel, Mel, and Schnur. 221,794.
Schweickart, Jay F., deceased, by B. J. Schweickart, administratrix, to Anchor Hocking Corp. Display stand or similar article. 221,815, 9–7–71, Cl. D80—9.
Shelkofsky, Clifford I., E. R. Wiener, E. Wittner, and E. L. Brown, to International Business Machines Corp. Electronic accounting machine. 221,772, 9–7–71, Cl. D26—5.
Shelkofsky, Clifford I., E. R. Wiener, E. Wittner, and E. L. Brown, to International Business Machines Corp. Electronic accounting machine. 221,773, 9–7–71, Cl. D26—5.
Simpkins, Terry J., to AMF Inc. Boat. 221,808, 9–7–71, Cl. D71—1.
Sit 'N Rest Golf, Inc.: *See*—
Yokers, Henry P. 221,783.
Smith, John J., to Mueller Co. Fire hydrant. 221,753, 9–7–71, Cl. D23—12.
Smith, John J., to Mueller Co. Fire hydrant. 221,754, 9–7–71, Cl. D23—12.
Societe Anonyme Automobiles Citroen: *See*—
Fabein, Henri. 221,747.
Starck, Arthur M. and W. R., to A.M.S. Corp. Window sash guide. 221,742, 9–7–71, Cl. D13—6.
Starck, William R.: *See*—
Starck, Arthur M. and W. R. 221,742.
Stokes, Rembert: *See*—
Genaro, Donald M., McGarvey, Stokes, and Sylvester. 221,767.
Stokes, Rembert R.: *See*—
Genaro, Donald M., Grote, McGarvey, and Stokes. 221,821.
Stuckey and Speer, Inc.: *See*—
Annesley, Robert H. 221,797.
Sopko, Albert J.: *See*—
Cetrone, Vincent B., and Sopko. 221,744.
Sylvester, Gordon E.: *See*—
Genaro, Donald M., McGarvey, Stokes, and Sylvester. 221,767.
Szirmay, Thomas, to Wentworth Industries Ltd. Dresser or similar article. 221,778, 9–7–71, Cl. D33—6.
Szirmay, Thomas, to Wentworth Industries. Armoire. 221,782, 9–7–71, Cl. D33—19.
Tatum, Grace R. A combined pin cushion and bank. 221,725, 9–7–71, Cl. D3—19.
Tek Plastics Ltd.: *See*—
Savedra, John. 221,768.
Thomas, Allan T.: *See*—
Moffatt, Glenn M., and Thomas. 221,792.
Topalis, Stylianos A., to The Quaker Oats Co. Expanded cereal food product. 221,723, 9–7–71, Cl. D1—2.
Tri-Vec, Inc.: *See*—
Kiniry, John M., Finazzo, and Carroll. 221,810.
Turner, Howard M.: *See*—
Adomaitis, Domas, and Turner. 221,733.
Unitek Corp.: *See*—
Johnston, Reece W. 221,764.
Johnston, Reece W. 221,765.

U.S. Philips Corp.: *See*—
Schellens, Henricus F. T. 221,790.
Van Skyhawk, Norman, to American Standard Inc. Shower enclosure wall unit. 221,760, 9–7–71, Cl. D23—49.
Warner-Lambert Pharmaceutical Co.: *See*—
Kronish, Donald P., and Zuriff. 221,751.
Warren Industrial Mfg. & Sales Co.: *See*—
Cetrone, Vincent B., and Sopko. 221,744.
Wentworth Industries: *See*—
Szirmay, Thomas. 221,782.
Wentworth Industries Ltd.: *See*—
Szirmay, Thomas. 221,778.
Wiener, Edward R.: *See*—
Sheikofsky, Clifford I., Wiener, Wittner, and Brown. 221,772.
Sheikofsky, Clifford I., Wiener, Wittner, and Brown. 221,773.
Wilkinson, Judkins E., to Atlanta Stove Works, Inc. Andiron. 221,761, 9–7–71, Cl. D23—102.
Williams, Merrill E. Kurling tool. 221,729, 9–7–71, Cl. D8—51.
Wittner, Ernest: *See*—
Sheikofsky, Clifford E., Wiener, Wittner, and Brown. 221,772.
Sheikofsky, Clifford E., Wiener, Wittner, and Brown. 221,773.
Wrightway Engineering Co.: *See*—
Benjamin, E. B. 221,756.
Yokers, Henry P., to Sit 'N Rest Golf, Inc. Golf club carrier. 221,783, 9–7–71, Cl. D34—5.
Zecchin, Guido, to Hudson Wire Co. Dispensing guide for a boxed coil of wire. 221,801, 9–7–71, Cl. D52—1.
Zuriff, Lee S.: *See*—
Kronish, Donald P., and Zuriff. 221,751.

CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 7, 1971

NOTE.—First number, class; second number, subclass; third number, patent number

2— 9	3,602,913	
19	3,602,915	
48	3,602,916	
90	3,602,914	
167	3,602,917	
197	3,602,918	
207	3,602,919	
4— 7	3,602,921	
100	3,602,922	
110	3,602,923	
142	3,602,924	
171	3,602,925	
5—111	3,602,926	
112	3,602,927	
331	3,602,929	
338	3,602,928	
9—347	3,602,930	
12—146	3,602,931	
13— 20	3,603,712	
15— 41	3,602,932	
50	3,602,933	
104.06:	3,602,934	
.09:	3,602,935	
181	3,602,936	
250.13:	3,602,937	
257.06:	3,602,939	
308	3,602,940	
314	3,602,938	
16— 21	3,602,941	
191	3,602,942	
18— 12	3,602,943	
13	3,602,944	
17	3,602,948	
19	3,602,945	
20	3,602,946	
30	3,602,947	
39	3,602,949	
125	3,602,950	
24— 16	3,602,957	
20	3,602,953	
	3,602,954	
81	3,602,955	
125	3,602,956	
205.14:	3,602,958	
230	3,602,959	
249	3,602,960	
262	3,602,961	
25— 30	3,602,962	
105	3,602,963	
28— 1	3,602,965	
.2	3,602,951	
	3,602,966	
4	3,602,967	
74	3,602,968	
76	3,602,964	
29—118	3,602,970	
203	3,602,971	
205	3,602,972	
227	3,602,973	
240.5	3,602,975	
243.5	3,602,974	
275	3,602,969	
407	3,602,976	
420	3,602,977	
471.1	3,602,978	
473.1	3,602,979	
509	3,602,980	
571	3,602,981	
577	3,602,982	
	3,602,983	
578	3,602,984	
588	3,602,985	
608	3,602,986	
30—228	3,602,988	
261	3,602,989	
273	3,602,987	
276	3,602,990	
346.51:	3,602,991	
31— 46	3,602,992	
32— 17	3,602,993	
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128 : 3,603,578
151 : 3,603,577
269— 28 : 3,603,579
42 : 3,603,580
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124 : 3,603,610
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109 : 3,603,624
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42 : 3,603,804
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214 : 3,603,657
319 : 3,603,658
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316— 17 : 3,603,661
317— 5 : 3,603,842
33 : 3,603,843
80 : 3,603,844
117 : 3,603,845
123 : 3,603,846
234 : 3,603,847
235 : 3,603,848
260 : 3,603,849
261 : 3,603,850
262 : 3,603,851
318—102 : 3,603,852
146 : 3,603,853
231 : 3,603,856
302 : 3,603,857
443 : 3,603,858
320— 1 : 3,603,859
2 : 3,603,860
14 : 3,603,861
39 : 3,603,862
321— 2 : 3,603,863
10 : 3,603,864
45 : 3,603,866
47 : 3,603,865
61 : 3,603,867
322— 7 : 3,603,868
31 : 3,603,869
323— 74 : 3,603,870
324— .5 : 3,603,871
16 : 3,603,872
30 : 3,603,873
40 : 3,603,874
62 : 3,602,952
71 : 3,603,875
78 : 3,603,876
97 : 3,603,877
161 : 3,603,879
169 : 3,603,878

324—182 : 3,603,880
325— 30 : 3,603,881
47 : 3,603,882
324 : 3,603,883
348 : 3,603,884
432 : 3,603,885
476 : 3,603,886
328— 59 : 3,603,887
112 : 3,603,888
133 : 3,603,889
134 : 3,602,994
329—101 : 3,603,890
330— 9 : 3,603,891
18 : 3,603,892
30 : 3,603,894
415 : 3,603,893
331— 17 : 3,603,893
94.5 : 3,603,895
96 : 3,603,896
107 : 3,603,897
111 : 3,603,906
333— 70 : 3,603,898
73 : 3,603,899
75 : 3,603,900
76 : 3,603,901
79 : 3,603,902
80 : 3,603,903
95 : 3,603,904
3,603,905
335—151 : 3,603,907
210 : 3,603,908
337—161 : 3,603,909
338—183 : 3,603,854
3,603,855
339— 22 : 3,603,918
45 : 3,603,910
89 : 3,603,912
104 : 3,603,913
143 : 3,603,914
186 : 3,603,915
217 : 3,603,916
220 : 3,603,917
267 : 3,603,911
340— 1 : 3,603,919
3 : 3,603,920
10 : 3,603,921
15.5 : 3,603,922
18 : 3,603,923
52 : 3,603,924
59 : 3,603,925
3,603,926
3,603,927
87 : 3,603,928
104 : 3,603,929
146.3 : 3,603,930
3,603,931
147 : 3,603,932
172.5 : 3,603,933
3,603,934
3,603,935
3,603,936
3,603,937
174 : 3,603,938
3,603,939
3,603,940
.1 : 3,603,941
3,603,943
3,603,944
3,603,945
.16: 3,603,942
177 : 3,603,946
213 : 3,603,947
214 : 3,603,948
3,603,949
222 : 3,603,950
224 : 3,603,951
3,603,952
228 : 3,603,953
237 : 3,603,954
239 : 3,603,955
249 : 3,603,956
258 : 3,603,957
274 : 3,603,958
3,603,959
309.1 : 3,603,960
.4 : 3,603,961
324 : 3,603,962
3,603,963
3,603,964
3,603,965
3,603,966
3,603,967
336 : 3,603,968
347 : 3,603,969

340—347 : 3,603,970
3,603,971
3,603,972
3,603,975
3,603,976
3,603,977
3,603,978
3,603,979
3,603,980
3,603,981
365 : 3,603,982
3,603,983
378 : 3,603,984
384 : 3,603,985
409 : 3,603,973
415 : 3,603,986
343— 5 : 3,603,988
3,603,989
3,603,990
3,603,991
3,603,992
6.5 : 3,603,993
7.3 : 3,603,994
3,603,995
.7 : 3,603,996
10 : 3,603,997
12 : 3,603,998
17.1 : 3,603,999
.7 : 3,604,000
18 : 3,604,001
100 : 3,604,002
112 : 3,604,003
113 : 3,604,004
225 : 3,604,005
705 : 3,604,006
720 : 3,604,007
745 : 3,604,008
754 : 3,604,009
756 : 3,604,010
766 : 3,604,011
768 : 3,604,012
786 : 3,603,987
346— 23 : 3,603,974
350— 3.5 : 3,603,662
4 : 3,603,663
83 : 3,603,664
96 : 3,603,665
3,603,666
103 : 3,603,667
162 : 3,603,668
186 : 3,603,669
260 : 3,603,670
310 : 3,603,671
314 : 3,603,672
351— 37 : 3,603,674
352— 5 : 3,603,673
56 : 3,603,675
91 : 3,603,676
124 : 3,603,677
169 : 3,603,678
353— 75 : 3,603,679
355— 3 : 3,603,680
17 : 3,603,681
356— 2 : 3,603,682
4 : 3,603,683
103 : 3,603,689
109 : 3,603,684
3,603,685
113 : 3,603,690
152 : 3,603,686
3,603,691
153 : 3,603,687
172 : 3,603,688
401— 81 : 3,603,693
139 : 3,603,692
150 : 3,603,694
415— 17 : 3,603,695
126 : 3,603,696
416— 33 : 3,603,697
157 : 3,603,698
171 : 3,603,699
180 : 3,603,700
204 : 3,603,701
220 : 3,603,702
417— 48 : 3,603,703
51 : 3,603,704
253 : 3,603,705
417 : 3,603,706
431— 16 : 3,603,707
45 : 3,603,708
131 : 3,603,709
255 : 3,603,710
352 : 3,603,711

D 1– 2	:	221,723	D13– 1	:	221,740	D23– 40	:	221,757	D26– 14	:	221,774	D44– 1	:	221,791	D71– 1	:	221,807
D 2–232	:	221,724			221,741			221,758			221,775			221,792			221,808
D 3– 19	:	221,725	6	:	221,742	45	:	221,759	D33– 2	:	221,776	10	:	221,793			221,809
D 5– 4	:	221,726	D14– 3	:	221,743	49	:	221,760	3	:	221,777	22	:	221,794	D72– 1	:	221,810
D 8– 7	:	221,727			221,744	52	:	221,768	6	:	221,778	26	:	221,796	D73– 1	:	221,811
30	:	221,728			221,745	57	:	221,769	7	:	221,779	29	:	221,795	D74– 13	:	221,812
51	:	221,729			221,746			221,770	14	:	221,780	D45– 10	:	221,797	D80– 9	:	221,813
266	:	221,730			221,747			221,771			221,781	D47– 5	:	221,798			221,814
D 9– 15	:	221,734			221,748	102	:	221,761	19	:	221,782	D48– 20	:	221,799			221,815
40	:	221,731	6	:	221,749	111	:	221,762	D34– 5	:	221,783	32	:	221,800	D81– 10	:	221,816
41	:	221,732	27	:	221,750	149	:	221,763	15	:	221,784	D52– 1	:	221,801			221,817
111	:	221,733	D15– 8	:	221,752	D24– 1	:	221,764			221,785	6	:	221,802	D83– 1	:	221,818
194	:	221,735	D16– 1	:	221,751			221,765			221,786	D54– 12	:	221,803			221,819
256	:	221,736	D23– 12	:	221,753	D26– 5	:	221,772	D35– 3	:	221,787	D55– 1	:	221,804	D85– 2	:	221,820
291	:	221,737			221,754			221,773			221,788	D56– 4	:	221,805	D86– 13	:	221,822
D13– 1	:	221,738	13	:	221,755	14	:	221,766	D42– 8	:	221,789	D64– 11	:	221,806	D87– 1	:	221,821
		221,739	35	:	221,756			221,767	D44– 1	:	221,790						

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,602,920	6 : 3,603,219	6 : 3,603,768	9 : 3,603,455	13 : 3,603,913	18 : 3,602,988
3,602,956	3,603,231	3,603,770	3,603,470	16 : 3,603,551	3,603,123
3,602,979	3,603,232	3,603,780	3,603,602	17 : 3,602,975	3,603,173
3,603,329	3,603,249	3,603,783	3,603,605	3,602,976	3,603,176
3,603,533	3,603,261	3,603,786	3,603,630	3,603,014	3,603,208
3,603,804	3,603,276	3,603,798	3,603,665	3,603,042	3,603,209
3,603,868	3,603,281	3,603,813	3,603,688	3,603,051	3,603,259
2 : 3,603,650	3,603,283	3,603,816	3,603,692	3,603,078	3,603,407
4 : 3,603,140	3,603,290	3,603,840	3,603,724	3,603,125	3,603,519
3,603,674	3,603,305	3,603,849	3,603,751	3,603,128	3,603,558
3,603,896	3,603,306	3,603,861	3,603,923	3,603,174	3,603,582
5 : 3,603,182	3,603,313	3,603,872	3,603,952	3,603,181	3,603,599
3,603,243	3,603,357	3,603,879	3,603,958	3,603,197	3,603,653
3,603,517	3,603,361	3,603,880	3,603,961	3,603,253	3,603,708
6 : 3,602,921	3,603,382	3,603,881	3,603,968	3,603,265	3,603,732
3,602,925	3,603,389	3,603,890	3,603,971	3,603,267	3,603,764
3,602,930	3,603,391	3,603,935	3,603,972	3,603,274	3,603,806
3,602,947	3,603,398	3,603,946	10 : 3,602,986	3,603,279	3,603,817
3,602,952	3,603,399	3,603,951	3,603,102	3,603,302	3,603,825
3,602,955	3,603,409	3,603,953	3,603,844	3,603,323	3,603,852
3,602,957	3,603,412	3,603,956	11 : 3,603,092	3,603,343	3,603,921
3,602,973	3,603,430	3,603,966	3,603,509	3,603,360	3,603,928
3,603,003	3,603,463	3,603,967	3,603,683	3,603,365	19 : 3,603,019
3,603,005	3,603,484	3,603,969	3,603,686	3,603,375	3,603,020
3,603,009	3,603,487	3,603,987	3,603,772	3,603,405	3,603,035
3,603,016	3,603,508	3,603,989	3,603,892	3,603,414	3,603,061
3,603,024	3,603,532	3,603,994	3,603,976	3,603,424	3,603,063
3,603,033	3,603,537	3,604,002	12 : 3,602,969	3,603,461	3,603,066
3,603,049	3,603,564	3,604,003	3,603,018	3,603,472	3,603,121
3,603,062	3,603,579	3,604,008	3,603,244	3,603,486	3,603,138
3,603,087	3,603,580	3,604,009	3,603,316	3,603,490	3,603,204
3,603,096	3,603,591	3,604,011	3,603,442	3,603,492	3,603,565
3,603,106	3,603,593	3,604,012	3,603,474	3,603,527	3,603,658
3,603,107	3,603,596	8 : 3,602,928	3,603,475	3,603,549	3,603,660
3,603,115	3,603,597	3,603,022	3,603,489	3,603,575	3,603,749
3,603,149	3,603,603	3,603,309	3,603,510	3,603,585	20 : 3,603,919
3,603,150	3,603,608	3,603,400	3,603,557	3,603,618	21 : 3,603,223
3,603,155	3,603,628	3,603,501	3,603,563	3,603,681	3,603,482
3,603,165	3,603,635	3,603,942	3,603,583	3,603,765	3,603,631
3,603,167	3,603,638	3,603,943	3,603,629	3,603,789	3,603,759
3,603,177	3,603,662	3,603,945	3,603,633	3,603,843	22 : 3,603,294
3,603,180	3,603,664	3,603,964	3,603,775	3,603,845	3,603,387
3,603,183	3,603,670	9 : 3,603,144	3,603,875	3,603,850	3,603,471
3,603,185	3,603,679	3,603,203	3,603,906	3,603,857	3,603,569
3,603,192	3,603,684	3,603,286	3,603,974	3,603,865	23 : 3,603,169
3,603,193	3,603,685	3,603,321	3,604,006	3,603,870	3,603,499
3,603,198	3,603,691	3,603,364	13 : 3,603,322	3,603,884	24 : 3,602,970
3,603,199	3,603,694	3,603,403	3,603,477	3,603,894	3,602,971
3,603,206	3,603,733	3,603,443	3,603,502	3,603,914	3,602,989
3,603,214	3,603,741	3,603,448	3,603,547	3,603,981	3,602,995

24 : 3,602,997
3,603,037
3,603,065
3,603,093
3,603,133
3,603,257
3,603,288
3,603,314
3,603,506
3,603,530
3,603,567
3,603,657
3,603,756
3,603,767
3,603,838
3,603,859
3,603,883
3,603,885
3,603,995
25 : 3,602,984
3,603,006
3,603,082
3,603,163
3,603,194
3,603,301
3,603,347
3,603,496
3,603,507
3,603,560
3,603,652
3,603,690
3,603,811
3,603,847
3,603,864
3,603,909
3,603,944
3,603,963
3,603,973
3,603,975
3,603,985
3,603,991
3,603,999
3,604,000
26 : 3,602,932
3,602,933
3,602,937
3,603,015
3,603,036
3,603,060
3,603,067
3,603,113
3,603,132
3,603,136
3,603,139
3,603,147
3,603,151
3,603,157
3,603,186
3,603,205
3,603,207
3,603,213
3,603,245
3,603,258
3,603,293
3,603,296
3,603,297
3,603,310
3,603,332
3,603,345
3,603,425
3,603,458
3,603,460
3,603,504
3,603,525
3,603,554
3,603,555
3,603,561
3,603,584

26 : 3,603,610
3,603,615
3,603,636
3,603,639
3,603,641
3,603,648
3,603,696
3,603,807
3,603,836
3,603,860
3,603,925
3,603,926
3,603,950
3,603,990
27 : 3,603,007
3,603,028
3,603,041
3,603,215
3,603,235
3,603,465
3,603,500
3,603,559
3,603,769
3,603,911
3,603,993
29 : 3,602,915
3,602,916
3,603,089
3,603,220
3,603,250
3,603,439
3,603,514
3,603,594
3,603,656
3,603,778
3,603,835
31 : 3,603,091
33 : 3,603,988
34 : 3,602,926
3,603,023
3,603,072
3,603,108
3,603,195
3,603,221
3,603,224
3,603,241
3,603,242
3,603,247
3,603,270
3,603,282
3,603,315
3,603,318
3,603,328
3,603,336
3,603,356
3,603,366
3,603,368
3,603,378
3,603,449
3,603,451
3,603,511
3,603,543
3,603,571
3,603,621
3,603,626
3,603,642
3,603,725
3,603,729
3,603,731
3,603,739
3,603,745
3,603,746
3,603,812
3,603,818
3,603,833
3,603,846
3,603,873
3,603,878

34 : 3,603,899
3,603,912
3,603,939
3,603,947
3,603,948
3,603,957
3,603,962
3,603,965
3,603,979
3,603,980
35 : 3,602,942
3,603,046
3,603,887
3,603,902
3,603,932
36 : 3,602,922
3,602,929
3,602,935
3,602,939
3,602,940
3,603,000
3,603,002
3,603,004
3,603,011
3,603,029
3,603,030
3,603,070
3,603,104
3,603,105
3,603,109
3,603,129
3,603,134
3,603,142
3,603,156
3,603,168
3,603,218
3,603,255
3,603,295
3,603,303
3,603,312
3,603,324
3,603,333
3,603,358
3,603,379
3,603,402
3,603,437
3,603,444
3,603,452
3,603,478
3,603,494
3,603,520
3,603,521
3,603,528
3,603,529
3,603,542
3,603,588
3,603,627
3,603,645
3,603,646
3,603,661
3,603,668
3,603,673
3,603,675
3,603,680
3,603,682
3,603,707
3,603,716
3,603,730
3,603,773
3,603,776
3,603,790
3,603,792
3,603,796
3,603,801
3,603,826
3,603,828
3,603,830
3,603,834

36 : 3,603,897
3,603,903
3,603,904
3,603,934
3,603,937
3,603,955
3,603,960
3,603,986
3,603,998
3,604,004
3,604,007
3,604,010
37 : 3,602,964
3,603,043
3,603,064
3,603,359
3,603,441
3,603,518
3,603,526
3,603,539
3,603,546
3,603,550
39 : 3,602,924
3,602,931
3,602,936
3,602,949
3,602,974
3,602,993
3,603,050
3,603,056
3,603,071
3,603,088
3,603,118
3,603,171
3,603,212
3,603,216
3,603,222
3,603,266
3,603,275
3,603,280
3,603,287
3,603,291
3,603,331
3,603,338
3,603,348
3,603,349
3,603,350
3,603,370
3,603,417
3,603,429
3,603,431
3,603,435
3,603,436
3,603,468
3,603,609
3,603,616
3,603,623
3,603,624
3,603,654
3,603,655
3,603,689
3,603,711
3,603,726
3,603,757
3,603,762
3,603,788
3,603,863
3,603,874
3,603,886
3,603,895
3,603,916
3,603,940
3,603,959
3,603,982
3,603,992
3,604,001
40 : 3,602,938
3,603,045

40 : 3,603,095
3,603,237
3,603,300
3,603,341
3,603,699
3,603,823
3,604,005
41 : 3,603,238
3,603,277
3,603,418
3,603,423
3,603,538
42 : 3,602,914
3,602,919
3,602,951
3,602,980
3,602,996
3,603,010
3,603,039
3,603,044
3,603,057
3,603,083
3,603,152
3,603,153
3,603,190
3,603,196
3,603,252
3,603,254
3,603,263
3,603,269
3,603,273
3,603,367
3,603,374
3,603,376
3,603,416
3,603,453
3,603,535
3,603,544
3,603,572
3,603,573
3,603,637
3,603,644
3,603,659
3,603,701
3,603,702
3,603,721
3,603,738
3,603,752
3,603,753
3,603,754
3,603,779
3,603,784
3,603,822
3,603,854
3,603,855
3,603,866
3,603,876
3,603,910
3,603,915
3,603,977
3,603,984
43 : 3,603,052
44 : 3,603,346
45 : 3,603,440
3,603,717
46 : 3,603,577
47 : 3,603,354
3,603,466
3,603,797
48 : 3,602,913
3,602,923
3,602,934
3,602,945
3,603,021
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56 : 3,603,592

1	221,761	9	221,729	17	221,754	30	221,804	36	221,819	42	221,762
	221,814		221,739		221,756	34	221,745	37	221,798	44	221,803
	221,816		221,740	18	221,743		221,751	39	221,724	48	221,764
4	221,811		221,741	19	221,726		221,767		221,728		221,765
6	221,730		221,742		221,763		221,794		221,744		221,769
	221,732		221,801	20	221,795	36	221,735		221,780		221,770
	221,734	12	221,766	26	221,802		221,772		221,800		221,771
	221,738		221,810		221,809		221,773		221,808		221,797
	221,752	17	221,723		221,821		221,775		221,815	49	221,760
	221,776		221,731	27	221,727		221,781	40	221,757	51	221,799
	221,777		221,733		221,784		221,789		221,758	53	221,812
	221,779		221,736		221,788		221,793	41	221,750	54	221,755
	221,786		221,737	29	221,746		221,796		221,787		221,759
	221,807		221,748		221,749		221,818	42	221,725	55	221,783
	221,817		221,753								

U.S. GOVERNMENT PRINTING OFFICE: 0——1971

U. S. DEPARTMENT OF COMMERCE
Maurice H. Stans, *Secretary*

PATENT OFFICE
Robert Gottschalk, *Acting Commissioner*